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Government Reports Announcements & Index
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ISSN 0097-9007

U.S. DEPARTMENT OF COMMERCE

NATIONAL TECHNICAL INFORMATION SERVICE
Melvin S. Day, Director

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GOVERNMENT REPORTS ANNOUNCEMENTS & INDEX

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FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

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FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

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FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

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*These categories were endorsed by the Committee on Scientific & Technical Information (COSATI) of the Federal Council for Science & Technology in 1964. A booklet describing these categories is available from NTIS; the order number is AD-612 200.

A price schedule, current on date of publication, is affixed to the outside back cover.

SAMPLE ENTRIES

MAIN ENTRY

Report entries are arranged by subject group and field. Within fields they are arranged alphanumerically by NTIS order number (accession number); alphabetic data precedes numeric.

Field 10 ENERGY CONVERSION (NON-PROPULSIVE)

Group 10A Conversion Techniques

Order number — **PB-254 315/5GA** — **PC A16/MF A01** — **Price codes**

Corporate author — Smithsonian Science Information Exchange, Inc., Washington, D.C.

Personal author — **Information on International Research and Development Activities in the Field of Energy**, David F. Hersey. May 76, 370p* NSF/RA-760057, Grant NSF-AER74-20678 — **Report title**

Keywords — descriptors & identifiers — Descriptors: *Directories, *Indexes (Documentation), *Energy, Research projects, Foreign countries, Bibliographies, Abstracts. Identifiers: Announcement bulletins.

This directory is the product of a data collection effort undertaken by the Smithsonian Science Information Exchange (SSIE) on behalf of an interagency committee formed under the U.S. State Department to provide international cooperation in energy research and development. Included is information covering 1766 ongoing and recently completed energy research projects conducted in Canada, Italy, the Federal Republic of Germany, France, the Netherlands, the United Kingdom, and 25 other countries. In addition to the title and text of project summaries, the directory contains the following indexes: Subject Index, Investigator Index, Performing Organization Index, and Supporting Organization Index. — **Abstract of report**

INDEX ENTRIES

Index entries are arranged alphanumerically. Titles are included in all indexes except the Contract Number index.

SUBJECT

ENERGY
Information on International Research and Development Activities in the Field of Energy.
PB-254 315/5GI 10A

Entries are sequenced by major subject term (the keywords with an asterisk) and by NTIS order number.

PERSONAL AUTHOR

HERSEY, DAVID F.
Information in International Research and Development Activities in the Field of Energy.
PB-254 315/5GI 10A

Entries are sequenced by personal author, report title, and NTIS order number.

CORPORATE AUTHOR

SMITHSONIAN SCIENCE INFORMATION EXCHANGE, INC., WASHINGTON, D.C.
Information on International Research and Development Activities in the Field of Energy.
(NSF/RA-760057)
PB-254 315/5GI 10A

Entries are sequenced by corporate author name, original report number, and NTIS order number. The monitor agency number is given following the report title.

CONTRACT GRANT NUMBER

NSF-AER74-20678
Smithsonian Science Information Exchange, Inc., Washington, D.C.
PB-254 315/5GI 10A

Entries are sequenced by contract or grant number, corporate author, and NTIS order number.

ACCESSION/REPORT NUMBER

PB-254 315/5GI
Information on International Research and Development Activities in the Field of Energy.
PB-254 315/5GI 10A PC A16/MF A01

Entries are sequenced by NTIS order, original report, or monitor agency number. Price codes are given in this index.

REPORTS ANNOUNCEMENTS

1. AERONAUTICS

1A. Aerodynamics

AD-A070 663/0GA PC **A09**/MF **A01**
Air Force Inst of Tech Wright-Patterson AFB OH School of Engineering
Prediction of Aerodynamic Forces on a Circular Cylinder and a Thin Airfoil in a Transonic Airstream by the Finite Element Method.
Doctoral thesis 1 Jan 77-20 Apr 79,
James E. Marsh. Mar 79, 186p Rept no. AFIT/DS/AA/79M-1

Descriptors: *Aerodynamic forces, *Thin wings, Finite element analysis, Transonic flow, Cylindrical bodies, Potential flow, Nonlinear differential equations, Inviscid flow, Shock waves, Iterations, Approximation(Mathematics), Theses.

The finite element method was used to solve the nonlinear, small-disturbance, transonic, velocity-potential equation for problems of steady flow over a circular cylinder and over a thin-airfoil in a uniform steady airstream. The governing differential equation is valid for inviscid, irrotational, isentropic flow of a perfect gas to include weak shocks providing airflow separation does not occur. For compressible subsonic and transonic flows the nonlinear small-disturbance equations was expressed in iterative form as a sequence of linear equations which was solved iteratively until the difference between two successive solutions became arbitrarily small. For analysis purposes the infinite flowfield was replaced by a finite but sufficiently large domain that was discretized with sector elements for the cylinder problem and rectangular elements for the airfoil problem. The finite element equtions were obtained from Galerkin's Method of Weighted Residuals. Boundary conditions of the Neumann type were imposed along the surface contour of the cylinder and along an approximate boundary in accordance with classical thin-airfoil theory for the airfoil. For both problems Dirichlet conditions were imposed along the farfield boundary from an asymptotic solution which satisfies the actual infinity condition and is valid in the farfield.

AD-A070 680/4GA PC **A02**/MF **A01**
Sibley School of Mechanical and Aerospace Engineering Ithaca NY
Numerical Calculation of Transonic Potential Flow About Wing-Body Combinations,
D. A. Caughey, and Anthony Jameson. 16 Jun 78, 10p
Contract N00014-77-C-0033
Prepared in cooperation with New York Univ., NY. Pub. in AIAA Jnl., v17 n2 p175-181 Feb 79.

Descriptors: *Potential flow, *Wing body configurations, Transonic flow, Computations, Flow fields, Numerical methods and procedures, Reprints.

No abstract available.

AD-A070 888/3GA PC **A03**/MF **A01**
Arizona Univ Tucson Engineering Experiment Station
A New Method for Designing Shock-Free Transonic Configurations.
Interim rept.,
H. Sobieczky, K.-Y. Fung, A. R. Seebass, and N. J. Yu. Jul 78, 37p TFD-78-04, AFOSR-TR-79-0615
Contract N00014-76-C-0182, Grant AFOSR-76-2954
Presented at the AIAA Fluid and Plasma Dynamics Conference (11th) Held at Seattle, 10-12 Jul 78. Paper 78-114. Sponsored in part by Grant NSG-2112.

Descriptors: *Supercritical airfoils, *Transonic airfoils, Three dimensional, Shock waves, Inviscid flow, Flow fields.
Identifiers: *Shock free airfoils.

A new method for the design of shock-free supercritical airfoils, wings, and three-dimensional configurations is described. Results illustrating this procedure in two and three dimensions are given. They include modifications to part of the upper surface of an NACA 64A410 airfoil that will maintain shock-free flow over a range of Mach numbers for a fixed lift coefficient, and the modifications required on part of the upper surface of a swept wing with an NACA 64A410 root section to achieve shock-free flow. While the results are given for inviscid flow, the same procedures can be employed iteratively with a boundary layer calculation in order to achieve shock-free viscous designs. With a shock-free pressure field the boundary layer calculation will be reliable and not complicated by the difficulties of shock-wave boundary-layer interaction. (Author)

AD-A071 197/8GA PC **A06**/MF **A01**
Advisory Group for Aerospace Research and Development Neuilly-sur-Seine (France)
Calendar of Selected Aeronautical and Space Meetings, July 1979 - December 1980.
Jun 79, 111p

Descriptors: *Space sciences, Symposia, Workshops, Aeronautics, Astronautics, Aerospace systems, Aerospace medicine, Electronics, Fluid dynamics, Guidance, Data processing.
Identifiers: *Meetings, NATO furnished.

Three kinds of events are covered by this calendar: Technical meetings, conferences, and symposia, held in all parts of the world, in the field of aerospace research and development as well as in other directly-related scientific fields, such as energy, geophysics, and acoustics. These meetings are listed in chronological order under ten topics. Exhibitions and technical displays; and Educational courses, short or long, given by certain specialized institutions.

N79-28118/4GA PC **E02**
National Aeronautics and Space Administration, Washington, DC.
Aeronautical Engineering: A Continuing Bibliography with Indexes, Supplement 108.
Apr 79, 154p NASA-SP-7037(108)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aerospace environments, Indexes (Documentation), Information systems.

For abstract, see STAR 1719

N79-28136/6GA PC **A08**/MF **A01**
New York Univ., NY. Courant Mathematics and Computing Lab.
An Artificial Viscosity Method for the Design of Supercritical Airfoils.
G. B. Mcfadden. Jul 79, 168p NASA-CR-158840, COO-3077-158
Contract NGR-33-016-201, Grant NSG-1579

Descriptors: *Airfoil profiles, Computational fluid dynamics, Computerized design, *Supercritical wings, Viscosity, Drag reduction, Partial differential equations, Pressure distribution, Transonic flow, Turbulent boundary layer.

For abstract, see STAR 1719

N79-28138/2GA PC **A06**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
The Effect of Canard Relative Size and Vertical Location on the Subsonic Longitudinal and Lateral-Directional Static Aerodynamic Characteristics for a Model with a Swept Forward Wing.
J. K. Huffman, and C. H. Fox, Jr. Jul 79, 106p NASA-TM-78739

Descriptors: *Canard configurations, *Static aerodynamic characteristics, *Subsonic speed, *Swept forward wings, Wind tunnel models, Angle of attack, *Fighter aircraft, Pressure distribution, Sideslip, Wind tunnel tests, Wing profiles.

For abstract, see STAR 1719

N79-28145/7GA PC **A06**/MF **A01**
Indian Inst. of Tech., Bombay. Dept. of Aeronautical Engineering.
Application of Vortex Lattice Method for the Evaluation of the Aerodynamic Characteristics of Wings With and Without Strakes.
Master's Thesis,
J. Singh. 1979, 114p

Descriptors: *Aerodynamic characteristics, Chords (Geometry), Computer programs, *Leading edge sweep, Vortex sheets, *Wing planforms, Flow charts, Leading edges, Lift, Potential flow, Prediction analysis techniques, Separated flow.

For abstract, see STAR 1719

N79-28146/5GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Wing Aerodynamic Loading Caused by Jet-Induced Lift Associated with STOL-OTW Configurations.
U. Vonglahn, and D. Groesbeck. 1979, 40p NASA-TM-79218, E-110
Conf-Presented at Atmospheric Flight Mech. Conf., Boulder, Colo., 6-8 Aug. 1979; Sponsored by Aiaa.

Descriptors: *Jet lift, *Short takeoff aircraft, *Wing loading, *Wing nacelle configurations, Chords (Geometry), Deflectors, Flow deflection, Nozzle geometry, Pressure distribution, Wing flaps.

For abstract, see STAR 1719

1B. Aeronautics

AD-A070 779/4GA PC **A05**/MF **A01**
Federal Aviation Administration Washington DC Systems Research and Development Service
Federal Aviation Administration - Florida Institute of Technology Workshop on Grounding and Lightning Technology Held on 6 - 8 March 1979, Melbourne, Florida. Supplement IA.
Final rept.
May 79, 99p Rept no. FAA-RD-79-6-SUPPL-1A
Supersedes rept. no. FAA-RD-79-6-SUPPL-1. Supplement 1A to report dated Mar 79, AD-A065 410.

Descriptors: *Electrical grounding, *Lightning, Aviation safety, Protective equipment, Electronic equipment, Aerospace systems, Avionics, Aircraft, Position finding, Tracking, Civil aviation, Flameout.
Identifiers: *Lightning protection, *Meetings.

Partial contents: Lightning Effects on General Aviation Aircraft; A New Approach to Lightning Positioning and Tracking; Design, Development and Fabrication of Devices for the Protection of Electronic Equipment against Lightning; Lightning Fatalities--Can They be Prevented; and Lightning Test Waveforms and Techniques for Aerospace Vehicles and Hardware.

AD-A071 057/4GA PC **A06**/MF **A01**
SRI International Menlo Park CA Aviation Systems Lab
Piloted Flight Simulation Study of Low-Level Wind Shear Phase 3. All-Weather Landing Systems, Engineering Services Support Project, Task 2.
Interim rept. Apr-Dec 77,
W. B. Gartner, D. M. Condra, W. H. Foy, W. O. Nice, and C. E. Wischmeyer. Mar 78, 123p FAA-RD-78-9
Contract DOT-FA75WA-3650

Descriptors: *Instrument landings, *Wind shear, Flight simulation, Flight instruments, Display systems, Ground speed, Performance(Human), Pilots, Man machine systems, Landing aids, Decision making, Jet transport planes.
Identifiers: DC-10 jet transport aircraft.

This task is concered with development and test by piloted flight simulation of airborne techniques designed to aid the pilot to detect and cope with low-level wind shear. This report documents the Phase 3 tests on a DC-10 aircraft simulator, involving a set of wind profiles significantly expanded over those used previously and an especially large group (26) of subject pilots in the major test. The operational situation simulated was a landing under Category I visibility to a 7000-ft runway with ILS guidance. There were 10 different wind profiles, with wind shear ranging from low to high severity. In an initial trial various aiding concepts were compared in individual experiments. This involved 4 versions of groundspeed displays, 2 versions of modified (acceleration-augmented) flight director steering and speed commands, and 2 go-around decision aids: a computation of longitudinal acceleration margin and an energy-rate meter. The more promising were combined in 3 systems

tested in a full trial. Performance was marginal, but would have been adequate if all the go-around advisories had been honored. False-alarm and missed-alarm rates of the advisories were too high. Additional work was recommended on go-around decision aids, the importance of effective go-around decision aids being emphasized. It was noted that the go-around warning requires improved consistency in backup information; an on-off display is not adequate.

AD-A071 131/7GA PC **A11**/MF **A01**
Advisory Group for Aerospace Research and Development Neuilly-sur-Seine (France)
The Guidance and Control of Helicopters and V/STOL Aircraft at Night and in Poor Visibility.
May 79, 238p Rept no. AGARD-CP-258
Presented at the AGARD Guidance and Control Panel Symposium (27th) in The Hague, The Netherlands, 9-12 October 1978. See also Supplement, AD-C018 063.

Descriptors: *Helicopters, *Vertical takeoff aircraft, *Short takeoff aircraft, *All weather aviation, *Flight control systems, Visibility, Low light levels, Adverse conditions, Aircraft landings, Night flight, Terrain following, Stabilization systems, Automatic pilots, Carbon dioxide lasers, Pattern recognition, Collision avoidance, Instrument flight, NATO.
Identifiers: NATO furnished, NAVTOLAND Project.

Partial Contents: The Challenge of Nap-of-the-Earth; Development and In-flight Evaluation of a Triplex Digital Autostabilisation System for a Helicopter; Aspects of the Design and Development of the Maritime Autopilot Modes for the Westland Lynx Helicopter; Design and Testing of a Redundant Skewed Inertial Sensor Complex for Integrated Navigation and Flight Control; Scan Converter and Raster Display Controller for Night Vision Displays; Applications of Pattern Recognition Systems for Day/Night Precision Aircraft Control; Heterodyning CO2 Laser Radar for Airborne Applications; A Self-contained Collision Avoidance System for Helicopters; Helicopter High Definition Rotor Blade Radar; Design Procedure for Aircrew Station Labeling, Selection and Abbreviation; Subjective Assessment of a Helicopter Approach System for IFR Conditions; Impact of Multi-function, Programmable, Control Display Unit in Affecting a Reduction of Pilot Workload; Etude d'Interface Equipage-Systeme dans un Helicoptere Anti-Char de Nuit; NAVTOLAND (Navy Vertical Takeoff and Landing Capability Development); Guidance and Control Unit for All Weather Approach; Simulation and Study of V/STOL Landing Aids for USMC AV-8 Aircraft; and Flight Control in an Integrated Guidance and Control System.

AD-A071 153/1GA MF **A01**
Army Aviation Engineering Flight Activity Edwards AFB CA
A Flight Research Investigation of Autorotational Performance and Height-Velocity Testing of a Single Main Rotor Single Engine Helicopter.
Final rept. May 68-Mar 69,
Kenneth R. Ferrell, Alan C. Frederickson, John J. Shapley, and Robert A. Kyker. Mar 76, 379p
Rept no. USAAEFA-68-25
Availability: Microfiche copies only.

Descriptors: *Autorotation, *Aircraft landings, *Flight maneuvers, Helicopter rotors, Pilots, Helicopters, Flight testing, High velocity, Test methods, Diving, Flareout, Aviation safety, Emergencies, Sea level, High altitude.
Identifiers: H-1 helicopters, UH-1C helicopters.

Autorotational performance and height-velocity (H-V) testing were conducted to examine the effects of pilot technique and operating variables on rotor performance and aircraft capability during these maneuvers. Various testing methods were compared and ways to provide the operators with more meaningful information were considered. The testing was conducted by the United States Army Aviation Engineering Flight Activity at Edwards AFB, CA, as well as at a sea-level site near Shafter, CA, and at high-altitude sites in the vicinity of Bishop, CA. The testing was accomplished with a UH-1C helicopter. Test results show that separating the H-V maneuver into entry, dive, flare, and landing phases during tests at a safe height above the ground provided the best evaluation of both aircraft behavior and pilot requirements. The H-V diagram was then developed using a selected technique or criteria in a much safer manner and with reduced flight time. An improved methodology was developed which utilized theory and preliminary flight data to produce H-V diagrams with a reduced testing hazard. A data presentation requirement was developed and a demonstration outline is shown.

1C. Aircraft

AD-A070 527/7GA PC **A02**/MF **A01**
School of Aerospace Medicine Brooks AFB TX
Fighter Index of Thermal Stress (FITS): Guidance for Hot-Weather Aircraft Operations.
Final rept.,
Sarah A. Nunneley, and Richard F. Stribley.
1979, 6p Rept no. SAM-TR-78-404
Pub. in Aviation, Space and Environmental Medicine, v50 n6 p639-642 Jun 79.

Descriptors: *Jet fighters, *Training planes, *Flight crews, *Thermal stresses, *Stress(Physiology), Low altitude, Hot weather, Indexes, Inflight, Data acquisition, Solar heating, Humidity, Protective clothing, Cockpits, Reprints.

No abstract available.

AD-A070 571/5GA PC **A04**/MF **A01**
Naval Surface Weapons Center White Oak Lab Silver Spring MD
Observations on Parachute Scale Factors for Modeling Parachute Deployment and Steady State Performance.
Final rept. for FY 78,
William P. Ludtke. 9 May 79, 65p Rept no. NSWC/WOL/TR-78-189

Descriptors: *Parachutes, *Aerodynamic characteristics, Mathematical models, Scaling factors, Mass number, Opening(Process), Shock, Deployment, Reynolds number, Inflating, Steady state, Altitude, Velocity.

A New approach to the scaling of parachute performance is presented, based upon variables inherent in the inflation process such as weight, time, geometry, etc. Limitations of conventional scaling parameters such as Reynold's, Froude, and Mach numbers as applied to parachutes are discussed. Examples of parachute inflation and steady state performance are correlated with a scale factor designated as a Mass Ratio, which is the ratio of the system mass to a mass of atmosphere associated with the parachute size, inflation time, altitude and deployment velocity. For advanced opening shock analyses, the concept of variable mass ratio during canopy inflation is proposed, and the effects of partial canopy inflation at suspension line stretch are discussed. Although the solid cloth types of parachutes are primarily used as examples, the ideas of mass ratio, initial area, and analysis techniques are applicable to all types of parachutes. (Author)

AD-A070 726/5GA PC **A08**/MF **A01**
United States Gauge Sellersville Pa
The Design and Development of a Wheel Mounted Aircraft Tire Inflation Indicator.
Technical documentary rept.,
J. D. Fulmer, and M. Mollick. Mar 66, 153p ASD-TDR-65-1
Contract AF 33(657)-12491

Descriptors: *Aircraft tires, *Pressure gages, Wheels, Environmental tests, Reliability, Shock tests, Acceleration, Tanker planes.
Identifiers: C-135 aircraft, KC-135 aircraft.

A pressure gauge which employs a relatively new pressure measuring concept and which can be permanently attached to an aircraft wheel was developed. The environmental and reliability testing demonstrated the ability of the system to withstand the extreme shock and accelerations associated with aircraft wheels without loss in accuracy. The development contract was also concerned with adapting the inflation measuring system to the standard KC-135 wheel. This required the design of a separable housing which replaced the valve stem of the tubeless tire and accommodated the pressure gauge. For future applications, it is suggested the gauge housing be made integral with the wheel rim casting rather than attached as a separate part.

AD-A070 731/5GA MF **A01**
Transportation Systems Center Cambridge MA
General Aviation Activity and Avionics Survey. 1977.
Annual summary rept. FY 1977,
Judith C. Schwenk. Apr 79, 151p TSC-FAA-79-16, FAA-MS-79-5
Availability: Microfiche copies only.

Descriptors: *Civil aviation, *Avionics, Surveys, Aircraft, Statistical analysis.
Identifiers: *General aviation aircraft.

This report presents the results and a description of the 1977 General Aviation Activity and Avionics Survey. The survey was conducted during early 1978 by the FAA to obtain information on the activity and avionics of the United States registered general aviation aircraft fleet, the dominant component of civil aviation in the U.S. The survey was based on a statistically selected sample of about 14.4 percent of the general aviation fleet and obtained a response rate of 80 percent.

AD-A070 806/5GA PC **A05**/MF **A01**
Dreyfus-Pellman Corp Stamford CT
Non-Contacting Electro-Optical Contouring of Helicopter Rotor Blades.
Final rept. Oct 77-Oct 78,
Marc G. Dreyfus, and Arnold Pellman. 11 Dec 78, 79p USAAVRADCOM-TR-79-30
Contract DAAK50-78-C-0008

Descriptors: *Rotor blades(Rotary wings), Contours, Measurement, Data processing, Lasers, Range finding.
Identifiers: *Helicopters.

Non-contact contour measurements of helicopter rotor blades to accuracies of 0.0001 in. are possible via range finding by triangulation employing electro-optical techniques. A laboratory breadboard of such a system has been built and tested. The results of these tests indicate that the construction of a full prototype system is feasible and desirable. (Author)

AD-A070 919/6GA PC **A05**/MF **A01**
Air Force Armament Lab Eglin AFB FL
Comparison of Store Airloads from 5.0 and 7.5 percent F-15 Wind Tunnel Tests.
Final rept. Sep 77-Jun 78,
Lawrence E. Lijewski. Nov 78, 76p Rept no. AFATL-TR-78-135

Descriptors: *External stores, *Jet fighters, *Aerodynamic loading, Scaling factors, Aerodynamic forces, Moments, Scale models, Wind tunnel tests, Experimental data, Angle of attack, Sideslip.
Identifiers: F-15 aircraft.

This report compares 5.0 and 7.5 percent scale aerodynamic force and moment data from external stores on the F-15 aircraft. The data was obtained at Mach numbers 0.80, 0.95, 1.05, and 1.20. Angles of attack tested were -6, -4, -2, 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20 degrees with angles of sideslip -8, 0, +8 degrees. Data taking hysteresis effects are also explored, as well as inboard pylon to centerline pylon effects on the data. (Author)

AD-A070 991/5GA PC **A09**/MF **A01**
Rockwell International Los Angeles CA Los Angeles Aircraft Div
MISDEM Computer Simulation. Volume II. Analyst Manual.
Final rept. Apr 75-Aug 76,
G. L. Gallien, and S. C. Silver. May 79, 178p NA-76-372 , JTCG/AS-76-S-004
Contract N00123-76-C-0159

Descriptors: *Survival(General), Computerized simulation, Models, Mathematical models, Missions, *Aircraft, Vulnerability, Weapon system effectiveness, Manuals.
Identifiers: MISDEM model.

The MISDEM (Mission/Damage Effectiveness Model) is a survivability/vulnerability model that transforms aircraft subsystem probabilities of survival into probabilities of aircraft survival and probabilities of various aircraft response modes, such as flight, countermeasures, and weapon delivery modes having different degrees of effectiveness. The model may be used to compute measures of effectiveness, such as numbers of targets killed in

a mission or campaign. It is intended for use in measuring the impact of vulnerability of subsystems on aircraft survival and effectiveness for unenhanced or protected subsystems. This analyst manual contains math model, applications, computer code, derivation, and test cases.

AD-A071 016/0GA PC **A16**/MF **A01**
Northrop Corp Hawthorne CA Aircraft Group
Advanced Weldbonding Process Establishment for Aluminum.
Final rept. Nov 76-Oct 78,
T. R. Croucher. Feb 79, 365p NOR-78-185, AFML-TR-79-4006
Contract F33615-76-C-5412

Descriptors: *Welding, *Bonding, *Airplane panels, *Aluminum alloys, Welded joints, Bonded joints, Fuselages, Manufacturing, Aircraft industry, Feasibility studies, Trade off analyses, Fatigue life, Cost analysis.
Identifiers: Weld bonding.

This program was conducted to establish the manufacturing parameters necessary to produce structural aircraft fuselage panels by the aluminum weldbonding process. These panels were representative of adhesive bonded panels currently being employed on the USAF/Fairchild Republic A-10. A design, feasibility and trade-off study was conducted by Fairchild, and a representative test panel was designed for comparing the structural performance of weldbond vs. adhesive bonded panels on a 1:1 basis. Northrop Corporation established the manufacturing procedures and process specifications which were used to manufacture the weldbonded panels. Fatigue and damage tolerance tests were conducted to evaluate the effect of different manufacturing variables on fatigue life. These tests showed that weldbonded structures would compare favorably with adhesive bonded structures, and would be significantly superior to riveted structures in low-load transfer fatigue applications.

AD-A071 034/3GA PC **A03**/MF **A01**
Army Research and Technology Labs Fort Eustis VA
Evaluation of Lightweight, Composite, Impact-Resistant Tail Rotor Drive Shafting for Helicopters.
Technical note, Jul 73-Dec 74,
Edward H. Dean. May 79, 40p Rept no. USARTL-TN-34

Descriptors: *Drive shafts, *Fiber reinforced composites, *Helicopter rotors, Tails(Aircraft), Helicopters, Impact strength, Test methods, Impact tests, Torsion, Torque, Filament wound construction, Epoxy resins, Graphite.

Three contractors, Whittaker Corporation, Lockheed-California Company, and Fiber Science Incorporated, each designed and fabricated five samples of a lightweight, composite, impact-resistant tail rotor drive shaft. The shaft specimens were proof tested by the contractors, and ATL performed evaluation testing. Test results indicated that both sandwich-wall and wet-filament-wound drive shafts exceeded stated design requirements, and that production of high quality composite drive shafts is feasible. The majority of test failures occurred in shaft end fittings, indicative that additional research and development effort is needed in end fitting design. (Author)

NTIS/PS-79/0858/5GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Clear Air Turbulence (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Sep 79, 37p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Clear air turbulence, *Bibliographies, Atmospheric motion, Aviation safety, Radar detection, Computerized simulation, Meteorological radar, Abstracts.

This bibliography cites articles covering research and analysis, theories and experiments, detection and measurement equipment, simulation modeling, and CAT accidents involving aircraft. (Contains 121 citations)

NTIS/PS-79/0859/3GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Aircraft Maintenance (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Gerald F. Zollars. Sep 79, 64p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Aircraft, *Maintenance, *Bibliographies, Commercial aircraft, Military aircraft, Avionics, Aircraft equipment, Test equipment, Aircraft engines, Scheduling, Reliability, Abstracts.
Identifiers: *Aircraft maintenance.

This bibliography of citations to the international literature concerns various aspects of aircraft maintenance. Both military and civil aviation experience are included. Articles cited concern airline operations, engine and avionics reliability, the use of automatic test equipment, maintenance scheduling, and reliability engineering. (Contains 262 citations)

NTIS/PS-79/0875/9GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Remotely Piloted Vehicles (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Sep 79, 47p
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Pilotless aircraft, *Remote control, *Bibliographies, Flight control, Design, Flight tests, Automatic control, Automatic pilots, Data links, Abstracts.
Identifiers: *Remotely piloted vehicles.

This bibliography cites articles concerning aircraft design, flight tests, aircraft control, cost effectiveness, automatic flight control, automatic pilots, and data links. Civil aviation applications are included, although military uses of remotely piloted vehicles are stressed. (Contains 181 citations)

NTIS/PS-79/0904/7GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Closed Loop Control Systems. Part 1. Aircraft (A Bibliography with Abstracts).
Rept. for Mar 75-Jul 79,
Guy E. Habercom, Jr. Sep 79, 150p
Supersedes NTIS/PS-78/0809 and NTIS/PS-77/0800. Updates NTIS/PS-75/364.

Descriptors: *Bibliographies, *Feedback control, Automatic control, Adaptive systems, Flight control, Drone aircraft, Aircraft, Guidance, Abstracts.
Identifiers: *Closed loop systems, *Remotely piloted vehicles.

Adaptive control and feedback control closed loop systems relative to aircraft flight control are investigated. Studies on guidance and control of drones and remotely piloted vehicles are included. (This updated bibliography contains 142 abstracts, 23 of which are new entries to the previous edition.)

N79-28119/2GA PC **A25**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
High Reynolds Number Subsonic Aerodynamics.
Apr 69, 584p VKI-LECTURE-Ser-16
Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 21-25 Apr. 1969.

Descriptors: *Aerodynamic characteristics, *Aeroelasticity, *Aircraft design, Reynolds number, *Subsonic aircraft, Aerodynamic noise, Airfoils, Computerized design, Flow visualization, Scale effect, Structural vibration, Wind tunnel tests.

For abstract, see STAR 1719

N79-28134/1GA PC **A02**/MF **A01**
Kentron International, Inc., Hampton, VA. Technical Center.
Sensitivity Study for a Remotely Piloted Microwave-Powered Sailplane Used as a High-Altitude Observation.
R. V. Turriziani. Jun 79, 15p NASA-CR-159089
Contract NAS1-13500

Descriptors: *Gliders, High altitude, Microwaves, *Remotely piloted vehicles, *Sensitivity, Aerodynamic characteristics, Drag, Energy storage, Lift drag ratio, Structural weight.
Identifiers: Microwave power transmission, Performance, Altitude, Distance.

For abstract, see STAR 1719

N79-28141/6GA PC **A06**/MF **A01**
Rockwell International, Columbus, OH.
Low Speed Wind Tunnel Test of Ground Proximity and Dec!: Edge Effects on a Lift Cruise Fan V/STOL Configuration, Volume 1.
Contractor Report, Mar. 1978 - Feb. 1979.
V. R. Stewart. May 79, 118p NASA-CR-152247, NR79H-12-V-1
Contract NAS2-9882

Descriptors: *Ground effect (Aerodynamics), *Lift fans, *V/stol aircraft, Floors, Low speed wind tunnels, Ships, Wind tunnel tests.

For abstract, see STAR 1719

N79-28142/4GA PC **A21**/MF **A01**
Rockwell International, Columbus, OH.
Low Speed Wind Tunnel Test of Ground Proximity and Deck Edge Effects on a Lift Cruise Fan V/STOL Configuration, Volume 2.
Contractor Report, Mar. 1978 - Feb. 1979.
V. R. Stewart. May 79, 484p NASA-CR-152248, NR79H-12-V-2
Contract NAS2-9882

Descriptors: *Ground effect (Aerodynamics), *Lift fans, *V/stol aircraft, Static thrust, Wind tunnel calibration, Wind tunnel tests.

For abstract, see STAR 1719

N79-28143/2GA PC **A07**/MF **A01**
General Dynamics Corp. Fort Worth, TX.
Aerodynamic Characteristics of Forebody and Nose Strakes Based on F-16 Wind Tunnel Test Experience. Volume 1: Summary and Analysis.
Final Report, 1 Sep. 1977 - 30 Sep. 1978.
C. W. Smith, J. N. Ralston, and H. W. Mann. Jul 79, 145p NASA-CR-3053
Contract NAS1-15006

Descriptors: *Aerodynamic characteristics, *F-16 aircraft, *Nose fins, Wind tunnel tests, Design analysis, Forebodies, Lift, Yf-16 aircraft.

For abstract, see STAR 1719

N79-28158/0GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Potential Applications of Advanced Aircraft in Developing Countries.
D. V. Maddalon. Jul 79, 43p NASA-TM-80133

Descriptors: *Air cargo, *Air transportation, *Brazil, *Developing nations, *Indonesia, *Remote regions, Agricultural aircraft, Economic factors, Forests, Industrial areas, Mining, Social factors.

For abstract, see STAR 1719

N79-28168/9GA PC **A07**/MF **A01**
McDonnell-Douglas Corp., St. Louis, MO.
Hypersonic Airframe Structures: Technology Needs and Flight Test Requirements.
Final Report.
J. E. Stone, and L. C. Koch. Jul 79, 134p NASA-CR-3130, MDC-A4839
Contract NAS1-14924

Descriptors: *Aircraft structures, *Hypersonic vehicles, *Technological forecasting, Flight tests, Research aircraft, Structural design, Thermodynamics.

For abstract, see STAR 1719

1D. Aircraft Flight Control and Instrumentation

N79-28167/1GA PC **A04**/MF **A01**
National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, CA.

AIFTDS Stand-Alone RMDU Flight Test Report.
D. O. Wilner. Jul 79, 63p NASA-TM-72866, H-1099

Descriptors: *Analog to digital converters, *Dynamic response, *Electronic modules, *Flight tests, *Multiplexing, Circuits, Data acquisition, Pulse code modulation, Shielding, Telemetry.
Identifiers: *Flight instruments.

For abstract, see STAR 1719

N79-28186/1GA PC **A04**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Predicting Dynamic Performance Limits for Servosystems with Saturating Nonlinearities.
J. A. Webb, Jr., and R. A. Blech. Jul 79, 52p NASA-TP-1488, E-9903

Descriptors: *Dynamic response, Nonlinear systems, *Servomechanisms, Acceleration (Physics), Actuators, Air flow, Electric motors, Hydraulic equipment, Iterative solution, Mathematical models, Systems engineering, Transfer functions, Valves, Velocity.
Identifiers: *Flight control systems.

For abstract, see STAR 1719

1E. Air Facilities

AD-A070 940/2GA PC **A04**/MF **A01**
Civil and Environmental Engineering Development Office Tyndall AFB FL Detachment 1 (ADTC)
A Literature Search and Review of the Dynamics of Aircraft-Surface Interaction.
Final rept. 1 Oct 77-31 May 78,
Joseph J. Cox, Jr., William M. Henghold, and John J. Russell. Jun 79, 61p Rept no. CEEDO-TR-78-39

Descriptors: *Runways, *Surface roughness, *Aircraft, *Loads(Forces), Computerized simulation, Fatigue(Mechanics), Human factors engineering, Trade off analyses, Roll, Yaw, Degrees of freedom, State of the art, Literature surveys.
Identifiers: Pavement wheel interactions.

This report presents a literature survey and review of the research concerned with the dynamics of aircraft-surface interaction. Of primary concern is the determination of surface roughness criteria based on how rough the surface can be without inducing structural damage in the aircraft. Attention is concentrated on analytical research in the form of computer simulation that deals with the aircraft response as a function of the input (external excitation), vehicle model, and the output. Basic conclusions include the fact that no current computer code is satisfactory but that one could be formulated within the state-of-the-art to correlate with on-going actual aircraft tests. To facilitate correlation the roll, yaw, and lateral degrees of freedom should be included and a fatigue analysis for the test aircraft should be made. (Author)

2. AGRICULTURE

2B. Agricultural Economics

PB-298 786/5GA PC **A06**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Foreign Investment in U.S. Agricultural Land - How It Shapes Up.
30 Jul 79, 122p* CED-79-114

Descriptors: *Land, *Agriculture, Statistical data, Purchasing, Western Europe, Agricultural economics, Investments, Farms, Washington(State), Texas, Pennsylvania, Montana, Forest land, Arkansas, California, Georgia, Illinois, Iowa, Kansas.
Identifiers: *Foreign investment, Foreign ownership.

The report, requested by the Senate Committee on Agriculture, Nutrition, and Forestry, provides an in-depth perspective on foreign investment in U.S. agricultural land. Foreign buyers from at least 30 countries bought about 8 percent (248,146 acres) of the 3 million acres of agricultural land that changed hands in a sample of 148 counties in 10 states during 18 months ended June 30, 1978. Foreign buyers bought relatively large acreages in some counties. Projecting purchase data statewide showed that 13.2 million acres changed hands in the 10 States, including 514,760 foreign-bought acres (4 percent). Most foreign-bought land went to Western Europeans--GAO did not find Arab investors to be a factor. The land was bought primarily for investment security and capital preservation and appreciation; most has continued in its same use; and some property improvements have been made. Available information indicates that foreign buyers did not consistently pay more than U.S. buyers for similar land. GAO believes the foreign investment situation bears watching--through the Agricultural Foreign Investment Disclosure Act of 1978--and that eliminating the tax advantage available to foreign, but not U.S., investors in U.S. land would be beneficial.

PB-298 789/9GA PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Family Farmers Need Cooperatives - But Some Issues Need to be Resolved.
Report to the Congress.
26 Jul 79, 99p* CED-79-106

Descriptors: *Farms, Cooperation, Prices, Legislation, Recommendations.
Identifiers: *Cooperatives, Unfair trade practices, Department of Agriculture.

The report discusses the importance of cooperatives to family farmers in the current agricultural structure and actions needed to be taken by the Congress and the Secretary of Agriculture to help ensure that cooperatives remain a viable force in assisting family farmers.

PB-298 810/3GA PC **A08**/MF **A01**
Economics, Statistics, and Cooperatives Service, Washington, DC.
Livestock and Meat Statistics (Supplement for 1978),
Polly Cochran. Aug 79, 166p* STATISTICAL BULL-522

Descriptors: *Livestock, *Meat, Statistical data, Cattle, Food processing, Hides, Production, Marketing, Prices, Consumption, Wool, Fats.
Identifiers: Foreign trade, Feedlots.

Data published in Livestock and Meat Statistics originate in the Livestock Division, Agricultural Marketing Service, and the Estimates Division and the National Economics Division of the Economics, Statistics, and Cooperatives Service. Included are data compiled by these divisions from other Government sources, such as statistics on the number of animals slaughtered under Federal inspection and the quantity of meat processed, prepared by the Animal and Plant Health Inspection Service; and foreign trade data, provided by the Bureau of the Census, Department of Commerce. Data on hides and skins are compiled from nongovernmental sources, such as Pratt's Daily Hide and Leather Market, and the National Provisioner.

PB-298 914/3GA PC **A05**/MF **A01**
Economics, Statistics, and Cooperatives Service, Washington, DC.
Proceedings of the National Conference of Bargaining and Marketing Cooperatives (23rd) Held at Las Vegas, Nevada on January 6-7, 1979.
Aug 79, 92p ESCS-65
Prepared in cooperation with National Committee on Agricultural Bargaining and Marketing Associations, Washington, DC.

Descriptors: *Meetings, Marketing, Bargaining, Labor relations, Farms, Agriculture, Organizations, Legislation, Litigation.
Identifiers: *Cooperatives.

This is a report of the proceedings of the 23rd National Bargaining Conference held January 6-7, 1979 in Las Vegas, Nevada. The conference was jointly sponsored by the cooperatives program of the Economics, Statistics, and Cooperatives Service (ESCS) of the U.S. Department of Agriculture and the National Committee of Agricultural Bargaining and Marketing Associations. ESCS prepared this report as a part of its activity of arranging and conducting the conference at the request of bargaining and marketing cooperatives. These proceedings include speeches at the conference on topics such as: mechanics of bargaining, farm labor issues, dealing with bargaining associations, experiences under the Agricultural Fair Practices Act of 1967, agriculture and international affairs, and supporting new bargaining legislation.

2D. Agronomy and Horticulture

N79-28647/2GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
Assessing Soybean Leaf Area and Leaf Biomass by Spectral Measurements.
B. N. Holben, C. J. Tucker, and C. J. Fan. Jul 79, 22p NASA-TM-80312
Subm-Submitted for Publication.

Descriptors: *Biomass, *Leaves, *Spectral signatures, Infrared spectra, Vegetation.
Identifiers: Plant canopies, Nondestructive testing, *Soybean plants, Remote sensing, Plant growth, Infrared photography, Correlation, Assessments.

For abstract, see STAR 1719

PB-298 875/6GA PC **A03**/MF **A01**
Tennessee Valley Authority, Chattanooga. Office of Natural Resources.
Accumulation of Atmospheric Sulfur by Plants and Sulfur-Supplying Capacity of Soils,
J. C. Noggle, and Herbert C. Jones. Apr 79, 49p TVA/ONR-79/109, EPA/600/7-79/109

Descriptors: *Plants(Botany), *Accumulation, *Sulfur, Soils, Air pollution, Environments, Plant ecology, Plant physiology, Measurements, Experimental data, Concentration(Composition), Farm crops, Soybean plants, Cotton plants, Grasses, Atmospheric conditions.
Identifiers: Ecosystems, Bioaccumulation, Fescue.

The Tennessee Valley Authority conducted studies to measure the amount of sulfur (S) that is transferred from the atmosphere to agro-ecosystems and to determine the S-supplying capacity of soils in the Tennessee Valley. Three techniques were tested for determining the fractional contribution of the soil and the atmosphere to the total S content in field-grown plants. Soybeans, cotton, and fescue were grown in equal quantities of the same soil with a low sulfur content at three field locations and in a greenhouse with charcoal-filtered air. Technique III, which provided a direct method for calculating the amount of plant S that was derived from the soil at any location, proved to be satisfactory for measuring the amount of atmospheric S accumulated by plants. Cotton grown 4 and 3 km from coal-fired power plants accumulated 125 and 240 mg S per 100 g, but fescue accumulated only 65 and 58 mg S per 100 g at the same locations. Cotton grown near the power plants produced significantly more biomass than that grown at a location remote to sources of SO2. The S-supplying capacity of selected soils was evaluated by measuring the rate of S accumulation by fescue grown in a greenhouse with charcoal-filtered air. The rate of S mineralization in soil collected from a depth of 0 to 30 cm at five sites was about 1 mg per kilogram of soil during the 27 weeks of plant growth.

2F. Forestry

PB-298 078/7GA PC **A03**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Quality Index Tables for Some Eastern Hardwood Species.
Forest Service research paper (Final),
Joseph J. Mendel, and William H. Smith. 1970, 28p FSRP-NE-167, NEFES/79-34

Descriptors: *Wooden logs, *Forest trees, *Hardwoods, Lumber, Quality, Maple trees, Oak trees, Poplar wood, Birch trees, Evaluation, Indexes(Ratios), Sawmills, Tables(Data), Pennsylvania.

Log-quality indexes based on 1964-68 lumber price reports for three regions and Forest Products Laboratory lumber grade yields are presented for white ash, beech, black cherry, hard maple, red oak, soft maple, white oak, yellow-poplar, and

birch. Methods are given for evaluating sawtimber logs in the sawmill yard and in the standing tree by using the log-quality index.

PB-298 079/5GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Lobeline Content of 'Lobelia inflata': Structural, Environmental and Development Effects.
Forest Service research paper (Final),
Arnold Krochmal, Leon Wilken, and Millie Chien. 1970, 19p FSRP-NE-178, NEFES/79-41

Descriptors: *Plant tissues, *Forestry, *Forest land, *Alkaloids, Smoking, Tobacco, Concentration(Composition), Yield, Soil properties, Comparison, Asthma, Bronchitis, Circulation.
Identifiers: *Lobelia inflata, Lobeline, Plant extracts.

A study was made of Lobelia inflata L. to determine the volume and distribution in the plant of lobeline (an alkaloid used in anti-smoking preparations), and the relationship between lobeline and soil factors. The highest concentration of lobeline is in the flowers, and the mature plant produces the greatest yields. No relationship was found between soil factors and lobeline content.

PB-298 081/1GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Effects of Defoliation and Drought on Root Food Reserves in Sugar Maple Seedlings.
Forest Service research paper (Final),
Johnson Parker. 1970, 12p FSRP-NE-169, NEFES/79-36

Descriptors: *Maple trees, *Droughts, *Defoliation, Glucose, Fructose, Starches, Forest trees, Comparison, Pennsylvania.
Identifiers: *Acer saccharum.

The root food reserves and starch levels in defoliated sugar maple seedlings were lower than in undefoliated controls. Unwatered seedlings did not have significantly lower root food reserves than watered controls. Starch levels were lower and glucose and fructose levels were higher in unwatered seedlings than in controls.

PB-298 082/9GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Yields of Eastern White Pine in New England Related to Age, Site, and Stocking.
Forest Service research paper (Final),
William B. Leak, Peter H. Allen, James P. Barrett, Frank K. Beyer, and Donald L. Mader. 1970, 19p FSRP-NE-176, NEFES/79-40

Descriptors: *Pine trees, *Yield, *Forestry, Age determination, Regression analysis, Site selection, Planting, Pennsylvania.
Identifiers: New England.

Regression equations are presented for predicting cubic-foot and board-foot yields of unmanaged eastern white pine stands in New England from stand age, site index, and percent stocking.

PB-298 176/9GA PC **A04**/MF **A01**
Missouri Univ.-Columbia. School of Forestry, Fisheries and Wildlife.
Impact of Water Level Changes on Woody Riparian and Wetland Communities. Volume IV: Eastern Deciduous Forest Region,
Robert O. Teskey, and Thomas M. Hinckley. Sep 78, 63p FWS/OBS-78/87
See also Volume 3, PB-276 038 and Volume 5, PB-298 177.

Descriptors: *Shrubs, *Plants(Botany), *Plant ecology, *Water supply, *Forest land, Estuaries, Swamps, Reviews, Tolerances(Physiology), Flooding, Plant physiology, Hardwoods, Forest trees, Oak trees, Maple trees, Ecological succession, Tables(Data), Great Lakes, Minnesota.
Identifiers: *Water levels, *Wetlands, Eastern Region(United States).

The purpose of this review is to consolidate existing information on the effect of water level changes on woody plants found in riparian and wetland communities. These plants are normally exposed to high groundwater levels as well as periods of excess water due to flooding. It is the effect of too much water rather than a water deficit which is often the cause of stress to the plant. This stress can result in decreased growth and even death, since a plant's response to flooded conditions depends on many factors, including the plant species, water level, duration of flooding and time of year. Available information for each species has been listed separately in a tabular format. This volume of the series covers the important woody plant species in the Eastern Deciduous Forest Region, which encompasses the area from southern Minnesota eastward to the Appalachians.

PB-298 177/7GA PC **A04**/MF **A01**
Missouri Univ.-Columbia. School of Forestry, Fisheries and Wildlife.
Impact of Water Level Changes on Woody Riparian and Wetland Communities. Volume V: Northern Forest Region,
Robert O. Teskey, and Thomas M. Hinckley. Sep 78, 64p FWS/OBS-78/88
See also Volume 4, PB-298 176 and Volume 6, PB-298 178.

Descriptors: *Marshes, *Forest trees, Plant growth, Shrubs, Flooding, Water rights, Acclimatization, Ground water, Mortality, Ecological succession, Minnesota, North Atlantic Ocean, Coasts.
Identifiers: *Woody plants, *Water levels, Species diversity, *Wetlands.

The purpose of this review is to consolidate existing information on the effect of water level changes on woody plants found in riparian and wetland communities. These plants are normally exposed to high groundwater levels as well as periods of excess water due to flooding. It is the effect of too much water rather than a water deficit which is often the cause of stress to the plant. This stress can result in decreased growth and even death, since a plant's response to flooded conditions depends on many factors, including the plant species, water level, duration of flooding and time of year. Available information for each species has been listed separately in a tabular format. This volume of the series covers the important woody plant species in the Northern Forest Region, which encompasses the Great Lakes region from Minnesota eastward to the Atantic Ocean.

PB-298 178/5GA PC **A03**/MF **A01**
Missouri Univ.-Columbia. School of Forestry, Fisheries and Wildlife.
Impact of Water Level Changes on Woody Riparian and Wetland Communities. Volume VI: Plains Grassland Region,
Robert O. Teskey, and Thomas M. Hinckley. Sep 78, 39p FWS/OBS-78/89
See also Volume 5, PB-298 177.

Descriptors: *Shrubs, *Forest trees, *Plant ecology, *Water supply, *Grassland, Ecological succession, Tolerances(Physiology), Flooding, Grasses, Pine Trees, Sites, Maple trees, Birch trees, Nut trees.
Identifiers: *Water levels, Wetlands, Great Plains Region(United States).

The purpose of this review is to consolidate existing information on the effect of water level changes on woody plants found in riparian and wetland communities. These plants are normally exposed to high groundwater levels as well as periods of excess water due to flooding. It is the effect of too much water rather than a water deficit which is often the cause of stress to the plant. This volume of the series covers the important woody plant species in the Plains Grassland Region, which covers the middle west of the United States from eastern Montana to western Minnesota and south to Texas.

PB-298 325/2GA PC **A07**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Toward Integrated Control. Proceedings of the Annual Northeastern Forest Insect Work Conference (3rd), Held at New Haven, Connecticut on 17-19 February 1970.
Final rept.
1971, 133p FSRP/NE-194, NEFES-79-49

Descriptors: *Pesticides, *Forestry, *Meetings, Insect control, Parasites, Ecology, Vertebrates, Invertebrates.
Identifiers: Predators.

The constraints on use of chemical pesticides have focussed attention on the need for broad, flexible, integrated, and ecologically acceptable programs of forest insect control. In eight papers presented at this workshop, the authors discuss the possibilities in use of vertebrate and invertebrate predators, pathogens, parasites, and insecticides.

PB-298 392/2GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Response to Crop-Tree Release by 7-Year-Old Stems of Yellow-Poplar and Black Cherry.
Forest Service research paper (Final),
G. R. Trimble, Jr. 1973, 14p FSRP-NE-253, NEFES/79-79

Descriptors: *Poplar wood, *Hardwoods, *Forestry, Sites, Height, Plant growth, Fruit trees, Forest trees, Mortality, Cutting, Improvement, Vines, Reproduction(Biology).
Identifiers: Central Appalachian Region(United States), Prunus serotina, Liriodendron tulipifera, Dominance.

Five years after crop-tree release of yellow-poplar and black cherry stems in a 7-year-old stand of Appalachian hardwoods, measurements indicated that released trees were but slightly superior to control trees in height, diameter, and crown position. Sprout regrowth of cut tree stems and grapevines had largely nullified the effects of release. Indications are that for release to be effective, crop trees of these species on good sites should be 15 to 20 feet tall.

PB-298 393/0GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Results of a 20-Year Test of Hybrid Poplars in West Virginia.
Forest Service research paper (Final),
George W. Wendel. 1972, 9p FSRP-NE-237, NEFES/79-72

Descriptors: *Poplar wood, *Forest trees, *Plant growth, Hardwoods, Sites, Height, Measurement, Periodic variations, West Virginia.
Identifiers: *Populus, Diameter base height.

Fifty hybrid poplar clones of the genus Populus were outplanted on a bottomland site in West Virginia. After 20 years, 7 clones have averaged 0.40 inch or more annual d.b.h. growth, and 5 have averaged more than 3.5 feet height growth per year. The best overall clone was NE-50, which averaged 10.0 inches d.b.h. and 80.5 feet in height.

PB-298 424/3GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
Pennsylvania's Private Woodland Owners. A Study of the Characteristics, Attitudes, and Actions of an Important Group of Decision-Makers.
Forest Service research paper (Final rept.),
David N. Larsen, and David A. Gansner. 1972, 23p FSRP/NE-219, NEFES/79-59

Descriptors: *Forestry, *Forest land, Attitude surveys, Wood products, Services, Pennsylvania, Evaluation.
Identifiers: *Ownership.

The report describes the characteristics, attitudes, and actions of farmers, small businessmen, and other private noncorporate woodland owners in Pennsylvania. They own about three-fourths of the forest land in the state. The information from this study provides a basis for evaluating the role of the private woodland owners as suppliers of forest products and services.

PB-298 705/5GA PC **A03**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
Heat and Water Vapor Flux in Conifer Forest Litter and Duff: A Theoretical Model.
Forest Service research paper (Final),
Michael A. Fosberg. Sep 75, 30p FSRP-RM-152

Descriptors: *Soils, *Forest lands, Softwoods, Heat flux, Water vapor, Evaporation, Soil proper-

ties, Mathematical models, Finite difference theory.
Identifiers: Forest litter.

The model was developed from numerical and analytical solutions of the diffusion forms of the mass continuity equation and the first law of thermodynamics. Analytical solutions provided a functional framework to evaluate nonlinear interactions obtained in the numerical solutions. Dimensional analysis was used to define the relationships between the soil properties used in the model.

PB-298 758/4GA PC **A06**/MF **A01**
Alaska State Dept. of Education, Juneau.
Applicability of Wildlands Fire-Fighting Techniques for Structural Fires (Alaska).
Jul 77, 106p

Descriptors: *Fire fighting, Forest fires, Fire detection systems, Forest land, Rural areas, Water supply, Personnel, Helicopters, Fire extinguishing agents, Houses, Aerial surveys, Air drop operations, Fire protection, California, Comparison, Alaska, Legislation, Fire protection.
Identifiers: *Wilderness areas.

The research report was prepared in compliance with the provisions of HCR-33 enacted by the State Legislature in 1975. The intent was to determine the applicability of wildlands fire suppression techniques and equipment as a basis for developing structural firefighting capability in the rural areas in the State. Those sponsoring the legislation made it clear that they were looking for an innovative approach to the project. This research study supports some well-known concepts while at the same time it opens up new vistas for those concerned with the future of fire suppression in Alaska. The study provides some previously unknown data which will become an important resource in searching for a systematic broad spectrum solution to Alaska's fire problem.

PB-298 765/9GA PC **A05**/MF **A01**
Oregon Legislative Assembly, Salem. Joint Interim Task Force on Forestry Policy.
Report of the Joint Interim Task Force on Forestry Policy (Oregon).
Mar 78, 94p

Descriptors: *Forestry, *Government policies, *Legislation, State government, Oregon, Lumbering, Wood products, Industries, Employment, Natural resources, Preservation.

The Joint Interim Task Force on Forestry Policy has concluded its examination of problems connected with forest practices in Oregon and offers the suggestions contained in the report as means for further strengthening the Forestry Program as a realistic alternative to reduced harvests and economic decline in the forest products industry.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

LBL-8738 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Position Sensors and Actuators for Figure Control of a Segmented Mirror Telescope.
G. Gabor. Jan 79, 17p CONF-790147-1
Contract W-7405-ENG-48
Society of photo-optical instrumentation engineers, instrumentation in Astronomy III symposium, Tucson, AZ, USA, 29 Jan 1979.

Descriptors: *Telescopes, Computers, Control systems, Design, Displacement gages, Mirrors.
Identifiers: ERDA/440300.

For abstract, see ERA citation 04:043701.

3B. Astrophysics

AD-A070 569/9GA PC **A03**/MF **A01**
Naval Research Lab Washington DC
Solar Flare Spectroscopic Diagnostics for Wavelengths Less Than 2000 Angstroms.
Interim rept.,
G. A. Doschek, and U. Feldman. 27 Jun 79, 33p Rept no. NRL-8307

Descriptors: *Solar flares, Emission spectra, Electron density, Ultraviolet spectroscopy, Temperature, Diagnosis(General), Ionization.
Identifiers: X ray spectra.

We discuss the use of intensity ratios of emission lines for determining the electron density and temperature in flare plasmas. The availability diagnostics cover the temperature range from about 40000 K to about 10000000 K. We summarize the current work on flare density diagnostics and review the applications of this theory to available flare spectra. We discuss the importance of line profiles for determining nonthermal mass motions in the plasma and for estimating path lengths along the line of sight. We review the current information on line profiles in flare spectra. We comment on determining departures from ionization equilibrium using line ratios in the x-ray and EUV regions. (Author)

AD-A070 903/0GA PC **A02**/MF **A01**
Air Force Geophysics Lab Hanscom AFB MA
Development of Solar Cycle 21 Observed in EUV Spectrum and Atmospheric Absorption,
H. E. Hinteregger. 11 Jul 78, 8p Rept no. AFGL-TR-79-0136
Pub. in Jnl. of Geophysical Research, v84 nA5, 1 May 79.

Descriptors: *Solar cycle, *Far ultraviolet radiation, Radiation absorption, Thermosphere, Atmosphere models, Reprints.

No abstract available.

AD-A070 945/1GA PC **A05**/MF **A01**
Massachusetts Inst of Tech Cambridge Center for Space Research
Analysis of Solar Wind Data from the SOLRAD 11A and 11B Spacecraft.
Final rept. 1 Feb 75-31 Mar 78,
Alan J. Lazarus. Feb 79, 89p AFGL-TR-79-0056
Contract F19628-75-C-0131

Descriptors: *Solar wind, Data acquisition, Data processing, Real time, Data reduction, Interplanetary space, Magnetohydrodynamics, Velocity, Density, Temperature, Scientific satellites.
Identifiers: SOLRAD satellites, SOLRAD 11A satellite, SOLRAD 11B satellite.

The data reduction, analysis, and interpretation of solar wind data obtained from the MIT experiment on the SOLRAD spacecraft are described.

AD-A071 062/4GA PC **A02**/MF **A01**
Iowa Univ Iowa City Dept of Physics and Astronomy
On the Inference of Properties of Saturn's Ring E from Energetic Charged Particle Observations.
Progress rept.
M. F. Thomsen, and J. A. Van Allen. Jun 79, 25p Rept no. U. OF IOWA-79-23
Contract N00014-76-C-0016

Descriptors: *Radiation belts, *Saturn(Planet), Trapping(Charged particles), Diffusion coefficient, Charged particles, Interference analyzers.
Identifiers: Saturn rings, Planetary magnetic fields.

Assuming that Saturn has trapped radiation belts similar to those of Earth and Jupiter, it is shown that observations of the radial dependence of the intensities, energy spectra, electron-to-proton intensity ratio, and pitch angle distributions of energetic charged particles trapped outside of Ring A can potentially provide information on the existence of Ring E, on the size distribution of the particulate matter therein, and on the magnitude of the radial diffusion coefficient for energetic particles. A parametric study of these possibilities is specialized to the characteristics of the University of Iowa detectors on Pioneer 11, which will make a close encounter with Saturn in August-September 1979. (Author)

LA-UR-78-3089 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Variable Star Research at Los Alamos.
C. G. Davis, A. N. Cox, and T. F. Adams. 1978, 12p CONF-781175-1
Contract W-7405-ENG-36
46. International Astronomical Union colloquium on Changing trends in variable star research, Hamilton, New Zealand, 27 Nov 1978.

Descriptors: *Cepheids, *Variable stars, Color, Emission spectra, Experimental data, Hertzsprung-russell diagram, Isolated values, Mass, Research programs, Stellar winds, Theoretical data.
Identifiers: ERDA/640102.

For abstract, see ERA citation 04:039731.

LA-UR-79-921 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Nonlinear Study of Al Velorum.
A. N. Cox, and S. W. Hodson. 1979, 14p CONF-790364-1
Contract W-7405-ENG-36
Nonradial and nonlinear stellar pulsation workshop, Tucson, AZ, USA, 12 Mar 1979.

Descriptors: *Cepheids, *Dwarf stars, *Star models, Hydrodynamics, Isolated values, Luminosity, Nonlinear problems, Pulsations, Radial velocity, Rotation, Star evolution, Temperature measurement, Theoretical data, Time dependence.
Identifiers: ERDA/640102.

For abstract, see ERA citation 04:043871.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A070 661/4GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
Two-Stream Parameterization of the Flux Divergence in a Plane-Parallel Atmosphere.
Interim rept.,
J. P. Apruzese, and Darrell F. Strobel. 5 Jun 79, 10p Rept no. NRL-MR-4016

Descriptors: *Radiative transfer, *Atmospheric physics, Diffusivity, Gaussian quadrature, Doppler effect, Numerical analysis, Cooling.

Accurate two-stream representation of the angular distribution of radiation exchange in a plane-parallel atmosphere requires the use of a diffusivity factor at least 13% larger than the normally chosen values of 1.66 or sq. rt. 3 (approx. = 1.732), since the flux divergence, rather than the transmitted flux, determines the heating or cooling rates. Diffusivity factors are calculated to yield exact results at various optical depths for Doppler and Lorentz line profiles as well as for the grey-absorption case. (Author)

AD-A070 662/2GA PC **A02**/MF **A01**
Iowa Univ Iowa City Dept of Physics and Astronomy
The Angular Distribution of Auroral Kilometric Radiation,
James L. Green, Donald A. Gurnett, and Stanley D. Shawhan. 13 Sep 76, 16p
Contracts N00014-76-C-0016, NAS1-11257
Sponsored in part by Grants NGL-16-001-002 and NGL-16-001-043 and Contracts NAS1-13129, NAS5-11074 and NAS5-11431.Pub. in Jnl. of Geophysical Research, v82 n13 p1825-1838, 1 May 77.

Descriptors: *Aurorae, Electromagnetic radiation, Magnetosphere, Scientific satellites, Measurement, Reprints.
Identifiers: *Low frequencies, Radio frequencies, Angular distribution.

No abstract available.

AD-A070 795/0GA PC **A03**/MF **A01**
Iowa Univ Iowa City Dept of Physics and Astronomy
A Correlation Between Auroral Kilometric Radiation and Inverted-V Electron Precipitation.
Progress rept.,
James Lauer Green, Donald A. Gurnett, and Robert A. Hoffman. Jan 79, 40p Rept no. U. OF IOWA-79-2
Contracts N00014-76-C-0016, NAS1-13129
Sponsored in part by Grant NGL-16-001-043.

Descriptors: *Aurorae, Radio waves, Atmospheric physics, Electrons, Scientific satellites.

Identifiers: Electron precipitation, AE-D satellite, Hawkeye satellite, *Low frequencies.

Simultaneous observations of energetic electron precipitations and auroral kilometric radiation (AKR) were obtained from the polar orbiting satellites AE-D and Hawkeye. The Hawkeye observations were restricted to periods when the satellite was in the AKR emission cone in the northern hemisphere and at radial distances > or = 7 R(E) to avoid local propagation cutoff effects. In addition, the AE-D measurements were restricted to complete passes across the auroral oval in the evening to midnight local time sector (from 20 to 01 hours magnetic local time). This is the local time region where the most intense bursts of AKR are believed to originate. A qualitative survey of AKR and electron particle precipitation shows that AKR is more closely associated with inverted-V electron precipitation than with plasma sheet precipitation. Quantitatively, a good correlation is found between the AKR intensity and the peak energy of inverted-V events. In addition, in the tail of the most field-aligned portion (approx. 0 deg. pitch angle) of the distribution functions of the inverted-V events, systematic changes are indicated as the associated AKR intensity increases.

AD-A070 901/4GA PC **A02**/MF **A01**
Air Force Geophysics Lab Hanscom AFB MA
Review of Quantitative Models of the 0- to 100-keV Near-Earth,
H. B. Garrett. 17 Oct 78, 23p Rept no. AFGL-TR-79-0130
Pub. in Reviews of Geophysics and Space Physics, v17 n3 p397-417 May 79.

Descriptors: *Plasmas(Physics), *Magnetosphere, Low energy, Statistical analysis, *Mathematical models, Reprints.

No abstract available.

AD-A070 902/2GA PC **A02**/MF **A01**
Regis Coll Weston MA
Low Density Regions Observed at High Altitudes and Their Connection with Equatorial Spread F,
W. J. Burke, D. E. Donatelli, R. C. Sagalyn, and M. C. Kelley. 28 Jul 78, 11p AFGL-TR-79-0131
Contracts F19628-75-C-0081, F19628-77-C-0122
Pub. in Planetary Space Science, v27 p593-601 1979.

Descriptors: *F region, *Atmospheric density, Electrostatic probes, Equatorial regions, Reprints.
Identifiers: Spread F, Equatorial spread F, ISIS-1 satellite.

No abstract available.

AD-A070 946/9GA PC **A03**/MF **A01**
Environmental Research and Technology Inc Concord MA
Meteorological Data Analyses in Support of the ABRES Program.
Final rept. Jan 76-Jan 79,
Kenneth R. Hardy. Jan 79, 28p ERT-P-1996-F, AFGL-TR-79-0084
Contract F19628-76-C-0069

Descriptors: *Meteorological data, *Atmosphere entry, Reentry vehicles, Guided missile trajectories, Meteorological radar, Meteorological satellites, Meteorological phenomena, Moisture content, Hydrometeors, Cirrus clouds, South Pacific Ocean.

The Air Force Geophysics Laboratory (AFGL) has been tasked by the Space and Missiles System Organization (SAMSO) to provide meteorological analysis in support of the Advanced Ballistic Reentry Systems (ABRES) Program. The primary objectives of the work carried out under this contract have been to assist AFGL in: (1) the analysis of surface, upper air, and satellite data leading to the computation of liquid water content profiles, (2) the analysis of special observational data obtained from aircraft flight experiments, (3) computer analysis of radar data, (4) development of display techniques for the AFGL Liquid Water Content Analyzer, (5) the evaluation of the uncertainties in the estimation of hydrometeor mass concentrations using radar and aircraft measurements, and (6) the assessment of thin cirrus cloud over the tropical Pacific.

AD-A070 947/7GA PC **A03**/MF **A01**
Rice Univ Houston TX
Study to Analyze and Synthesize Satellite Data.
Final rept. 1 Oct 77-30 Sep 78,
M. Harel, P. H. Reiff, R. W. Spiro, and R. A. Wolf. 15 Jan 79, 32p AFGL-TR-79-0024
Contract F19628-78-C-0078

Descriptors: *Magnetic storms, Computerized simulation, Magnetosphere, Ionosphere, Magnetometers, Data acquisition, Scientific satellites, Comparison, Mathematical models, Plasmas(Physics).
Identifiers: S3-2 satellite.

We have completed four computer runs simulating the behavior of the earth's inner magnetosphere during the substorm-type event that had its onset at about 1000 UT on 19 September 1976. Our program simulated many aspects of the behavior of the closed-field-line portion of the auroral and subauroral ionosphere. For these regions, the program self-consistently computes electric fields, electric currents, hot-plasma densities, plasma flow velocities and other parameters. Our computed ionospheric electric fields compare reasonably well with corresponding data from satellite S3-2. The most striking observational feature of the electric fields in the modeled region during the 19 September 1976 event was an instance of rapid subauroral flow, which was observed on the outbound part of pass 4079B South and was also predicted by the computer runs. These computer results seem consistent with a simple analytic model for rapid subauroral flow developed by Southwood and Wolf. Birkeland-current densities predicted by the model are presented, for eventual comparison with S3-2 magnetometer data. A program has been developed to follow the evolution of the plasmasphere, or any other magnetospheric or upper-ionospheric cold-plasma boundary, through a modeled event. Some interesting preliminary results for computed plasmasphere shapes are presented. (Author)

AD-A070 965/9GA PC **A03**/MF **A01**
Harry Diamond Labs Adelphi MD
Possible Use of Two Laser Beams to Determine Particle-Size Distribution.
Technical rept.,
Donald E. Wortman. Jan 79, 49p Rept no. HDL-TR-1878

Descriptors: *Particle size, *Light scattering, Laser beams, Dielectrics, Fog, Aerosols, Electric fields, Resonant frequency, Vibration, Carbon dioxide lasers, Helium neon lasers.
Identifiers: Optical measurement, Laser applications.

A study was made to determine whether particle-size distributions for small diameter aerosols (radius < or = 20 microns) such as fog can be determined by a new technique based on resonantly distorting the liquid drops by an oscillating electric field at the drops' mechanical vibrational frequencies. This field was transmitted by a linearly polarized CO2 laser of intensity 100 W/sq. cm. amplitude modulated at frequencies between 40,000 and 3,000,000 Hz, which correspond to the fundamental vibration frequencies of drops varying in radius from 21.2 to 1.19 microns. An unmodulated, 2-mW He-Ne laser was beamed along the path of the CO2 radiation, and scattering of this light was observed. The intensity of the He-Ne light scattered from the drops at the resonance frequency should be proportional to the density of the drops in the fog that oscillate at that frequency. A sensitive detection system able to measure ac signals with intensities as low as 10 to the -17th power W collected the scattered He-Ne light.

AD-A070 966/7GA PC **A05**/MF **A01**
Boston Univ MA Dept of Astronomy
The Influence of Geomagnetic Activity on the Day-to-Day Variability of the Ionospheric F-Region.
Scientific rept. no. 1 (Annual), 1 Oct 77-30 Sep 78,
Michael Mendillo, and Francis X. Lynch. Jan 79, 79p ACBU-SER-III-NO-10, AFGL-TR-79-0074
Contract F19628-77-C-0270

Descriptors: *F region, Geomagnetism, Variations, Electrons, Statistical analysis.
Identifiers: Total electron content, *Magnetic storms.

This report describes a summary of preliminary findings concerning the search for a geomagnetic activity control of ionospheric variability. The results are encouraging in that the division of a month's worth of F-region data into a geomagnetically ordered hierarchy may lead to a satisfactory forecasting scheme for day-to-day variability. The five geomagnetically quiet days of the month (QQ-days) were seen to behave in a consistent way for seasons and stations where the disturbed days had a well-defined pattern. The geomagnetic storm associated disturbed days within a month are themselves best handled by superimposed epoch derived average storm patterns for each day of a storm period. Thus, if storm days and QQ days are removed from a monthly distribution, the remaining 15-20 days may either fall within acceptable variability limits or lend themselves to 'QQ-like' 'DD-like' classifications. (Author)

COO-4470-13 PC **A02**/MF **A01**
Research Triangle Inst., Research Triangle Park, NC.
Coastal-Inland Solar Radiation Difference Study. Quarterly Conference Report.
W. D. Bach, Jr. Oct 78, 14p
Contract EG-77-C-02-4470

Descriptors: *Insolation, *Solar radiation, Calibration, Data acquisition, Data analysis, Meteorology, North Carolina, Quality assurance.
Identifiers: ERDA/140100, Coasts, Southeastern Region(North Carolina).

For abstract, see ERA citation 04:040506.

LBL-8696 PC **A08**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Atmospheric Aerosol Research. Annual Report, 1977–1978.
H. Rosen. 1978, 168p
Contract W-7405-ENG-48

Descriptors: *Aerosols, Aerosol monitoring, Chemical properties, Leading abstract, Mathematical models, Physical properties.
Identifiers: ERDA/500200, Atmospheric chemistry, Chemical analysis, Gas analysis, *Air pollution, Air pollution detection.

For abstract, see ERA citation 04:045320.

LBL-8778 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Spectral Measurements of Infrared Sky Radiance.
P. Berdahl, and M. Martin. Jan 79, 13p CONF-790118-3
Contract W-7405-ENG-48
National passive solar conference, San Jose, CA, USA, 11 Jan 1979.

Descriptors: Buildings, Arizona, Computer calculations, Energy balance, Heat transfer, *Infrared radiation, Infrared spectra, Radiative cooling, Texas.
Identifiers: ERDA/140100, ERDA/140901, *Sky brightness, Tucson(Arizona), San Antonio(Texas), LOWTRAN 3B computer program.

For abstract, see ERA citation 04:040508.

NTIS/PS-79/0874/2GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Air Sampling (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Sep 79, 64p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Air pollution, *Bibliographies, Concentration(Composition), Chemical analysis, Sampling, Monitoring, Urban areas, Aerosols, Particles, Atmospheric diffusion, Gas analysis, Laboratory equipment, Troposphere, Stratosphere, Transport properties, Remote sensing, Industrial wastes, Combustion products, Exhaust emissions, Dust.
Identifiers: *Air pollution sampling, *Air quality, Atmospheric chemistry, Air pollution detection.

This bibliography cites articles covering air pollution, pollution monitoring, aersols, particulate sampling, atmospheric composition, urban research, ozone, and atmospheric chemistry. Articles con-

cerning measurement and analysis methods are stressed. (Contains 270 citations)

PB-299 072/9GA PC **A02**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Atmospheric Physics and Chemistry Lab.
Comparison of Spectroscopic and Radiometric Measurements of Upper Atmosphere Water Vapor.
Technical rept.,
Ira G. Nolt, James V. Radostitz, Russell J. Donnelly, and Lois P. Stearns. May 79, 24p
NOAA-TR-ERL-406, APCL-44, NOAA-79071308
Prepared in cooperation with Oregon Univ., Eugene.

Descriptors: *Stratosphere, *Water vapor, Concentration(Composition), Measurement, Radiometers, Spectrometers, Upper atmosphere, Atmospheric models, Mathematical models.

This report compares simultaneous spectroscopic and radiometric measurements of atmospheric water vapor overburden. The measurements taken during 15 flights indicate that both techniques give the same water vapor overburden to within 1 micrometer of precipitable water vapor, and the median water vapor overburden is 6.5 micrometers precipitable water vapor at 41,000 ft (approx 180 mbar pressure) in the mid-latitude western United States during the summer/fall season, with a range from 4 to 11 micrometers.

4B. Meteorology

AD-A070 549/1GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702A GSRS, Missile Number 087, Round Number B-11.
Meteorological data rept.
Apr 79, 15p Rept no. ECOM-DR-1002

Descriptors: *Meteorological data, Artillery rockets, Atmospheric temperature, Wind, Barometric pressure, High altitude, New Mexico.
Identifiers: General Support Rocket System, Impact prediction, Sounding rockets.

Meteorological data gathered for the launching of 19702A GSRS, Missile Number 087, Round Number B-11, are presented in tabular form. (Author)

AD-A070 556/6GA MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702A GSRS, Missile Number N/A, Round Number B-6/B-7 (26 March 1979).
Meteorological data rept.
Mar 79, 25p Rept no. ECOM-DR-995
Availability: Microfiche copies only.

Descriptors: *Meteorological data, Artillery rockets, Atmospheric temperature, Wind, Barometric pressure, High altitude, New Mexico.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction.

Meteorological data gathered for the launching of 19702A GSRS, Missile Number N/A, Round Number B-6/B-7, are presented in tabular form. (Author)

AD-A070 557/4GA MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
12823AT Lance, Missile Number 3382, Round Number 327ECL (8 March 1979).
Meteorological data rept.
Mar 79, 38p Rept no. ECOM-DR-992
Availability: Microfiche copies only.

Descriptors: *Meteorological data, Surface to surface missiles, Atmospheric temperature, Wind, Barometric pressure, High altitude, New Mexico.
Identifiers: Lance missiles, Sounding rockets, Impact prediction.

Meteorological data gathered for the launching of 12823AT Lance, Missile Number 3382, Round Number 327ECL, are presented in tabular form. (Author)

AD-A070 558/2GA MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19304D GSRS, Missile Number 1023, Round Number V-23.
Meteorological data rept.
Apr 79, 16p Rept no. ECOM-DR-1004
Availability: Microfiche copies only.

Descriptors: *Meteorological data, Artillery rockets, Atmospheric temperature, Wind, Barometric pressure, High altitude, New Mexico.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction.

Meteorological data gathered for the launching of 19304D GSRS, Missile Number 1023, Round V-23, are presented in tabular form. (Author)

AD-A070 559/0GA MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19035D GSRS, Missile Number 1020, Round Number V-21.
Meteorological data rept.
Apr 79, 15p Rept no. ECOM-DR-999
Availability: Microfiche copies only.

Descriptors: *Meteorological data, Artillery rockets, Atmospheric temperature, Wind, Barometric pressure, High altitude, New Mexico.
Identifiers: General Support Rocket System, Soulnding rockets, Impact prediction.

Meteorological data gathered for the launching of 19305D GSRS, Missile Number 1020, Round V-21, are presented in tabular form. (Author)

AD-A070 560/8GA MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702 GSRS, Missile Number 386, Round Number B-5.
Meteorological data rept.
Mar 79, 19p Rept no. ECOM-DR-993
Availability: Microfiche copies only.

Descriptors: *Meteorological data, Artillery rockets, Atmospheric temperature, Wind, Barometric pressure, High altitude, New Mexico.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction.

Meteorological data gathered for the launching of 19702 GSRS, Missile Number 386, Round Number B-5, are presented in tabular form. (Author)

AD-A070 562/4GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702A GSRS, Missile Number 339, Round Number B-8.
Meteorological data rept.
Apr 79, 19p Rept no. ECOM-DR-998

Descriptors: *Meteorological data, Artillery rockets, Atmospheric temperature, Wind, Barometric pressure, High altitude, New Mexico.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction.

Meteorological data gathered for the launching of 19702A GSRS, Missile Number 339, Round B-8, are presented in tabular form. (Author)

AD-A070 563/2GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702A GSRS, Missile Number 361, Round Number B-4.
Meteorological data rept.
Mar 79, 19p Rept no. ECOM-DR-991

Descriptors: *Meteorological data, Radiosondes, Wind, Guided missiles, Tables(Data), Anemometers, Launching, Ballistics.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction, New Mexico.

Meteorological data gathered for the launching of 19702A GSRS, Missile Number 361, Round Number B-4, are presented in tabular form. (Author)

AD-A070 564/0GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19304B GSRS, Missile Number 1022, Round Number V-22.
Meteorological data rept.
Apr 79, 18p Rept no. ECOM-DR-1000

Descriptors: *Meteorological data, Radiosondes, Wind, Guided missiles, Tables(Data), Anemometers, Launching, Ballistics.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction, New Mexico.

Meteorological data gathered for the launching of 19304B GSRS, Missile Number 1022, Round V-22, are presented in tabular form. (Author)

AD-A070 565/7GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19304D GSRS, Missile Number 1021, Round No. V-24.
Meteorological data rept.
Apr 79, 16p Rept no. ECOM-DR-1005

Descriptors: *Meteorological data, Radiosondes, Wind, Guided missiles, Tables(Data), Anemometers, Launching, Ballistics.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction, New Mexico.

Meteorological data gathered for the launching of 19304D GSRS, Missile Number 1021, Round Number V-24, are presented in tabular form. (Author)

AD-A070 566/5GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702A GSRS, Missile Number 086, Round Number B-9.
Meteorological data rept.
Apr 79, 19p Rept no. ECOM-DR-1001

Descriptors: *Meteorological data, Radiosondes, Wind, Guided missile launchers, Guided missiles, Tables(Data), Towers, Anemometers, Launching, Ballistics.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction, New Mexico.

Meteorological data gathered for the launching of 19702A GSRS, Missile Number 086, Round No. B-9, are presented in tabular form. (Author)

AD-A070 642/4GA PC **A03**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
14818C Lance Missile Number 4355 Round Number 329 APT.
Meteorological data rept.
Apr 79, 33p Rept no. ERADCOM/ASL-DR-1006

Descriptors: *Meteorological data, Wind velocity, Atmospheric sounding, Ballistic trajectories, Surface to surface missiles, Tables(Data).
Identifiers: Lance missiles, Sounding rockets, Impact prediction, New Mexico.

Meteorological data gathered for the launching of 14818C Lance, Missile Number 4355, Round Number. 329 APT, are presented in tabular form. (Author)

AD-A070 707/5GA MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702A GSRS, Missile Number 301, Round Number B-10.
Meteorological data rept.
Apr 79, 16p Rept no. ECOM-DR-1003
Availability: Microfiche copies only.

Descriptors: *Meteorological data, Wind, Guided missiles, Launching, Instrumentation, Sounding rockets, Anemometers, Tables(Data).

Identifiers: General Support Rocket System, Impact prediction, New Mexico.

Meteorological data gathered for the launching of 19702A GSRS, Missile Number 301, Round Number B-10, are presented in tabular form. (Author)

AD-A070 814/9GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
19702A GSRS, Round Numbers B-2 and B-3 (21 February 1979).
Meteorological data rept.
Mar 79, 24p Rept no. ECOM-DR-990

Descriptors: *Meteorological data, Ballistic trajectories, Wind velocity, Tables(Data), Atmospheric sounding.
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction, New Mexico.

Meteorological data gathered for the launching of 19702A GSRS, Round Numbers B-2 and B-3 are presented in tabular form. (Author)

AD-A070 830/5GA PC **A02**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
(FA) 19304 GSRS, Missile Number 1019, Round Number V-20.
Meteorological data rept.
Mar 79, 19p Rept no. ECOM-DR-996

Descriptors: *Meteorological data, Ballistic trajectories, Atmospheric sounding, Wind velocity, Tables(Data).
Identifiers: General Support Rocket System, Sounding rockets, Impact prediction, New Mexico.

Meteorological data gathered for the launching of (FA) 19304 GSRS, Missile Number 1019, Round Number V-20, are presented in tabular form. (Author)

AD-A070 875/0GA PC **A02**/MF **A01**
Brown Univ Providence RI Div of Engineering
A Note on the Finite Amplitude Dynamics of Spatially Growing Baroclinic Waves on an F-Plane.
Technical rept.,
Lee-or Merkine. 20 Jan 78, 11p
Contract N00014-76-C-0363
Pub. in Tellus, v30 n6 p477-486 1978.

Descriptors: *Atmospheric motion, Inviscid flow, Dynamics, Flow fields, Reprints.
Identifiers: *Baroclinic waves, Cyclogenesis, Baroclinicity.

No abstract available.

AD-A070 904/8GA PC **A09**/MF **A01**
Fleet Weather Central/Joint Typhoon Warning Center FPO San Francisco 96630
Annual Typhoon Report, 1978.
Rept. for Jan-Dec 78,
Dean R. Morford, and James K. Lavin. 1978, 176p

Descriptors: *Tropical cyclones, Pacific Ocean, Position(Location), Weather forecasting, Reconnaissance, Tracking, Meteorological charts, Photographs, *Typhoons, Hurricanes.
Identifiers: North Pacific Ocean, Bengal Bay, Spaceborne photography.

This annual publication summarizes the tropical cyclone season in the western North Pacific, Bay of Bengal, and the central North Pacific. A brief narrative is given on each typhoon in the western North Pacific including the best track. Pertinent reconnaissance data used to construct the best tracks are provided. Forecast verification data and statistics for the JTWC are summarized. Research efforts at the JTWC are discussed briefly. (Author)

AD-A070 956/8GA MF **A01**
BDM Corp Monterey CA
Aircraft Measurements of Micrometeorological Parameters at Panama City, Florida, in 1978.
Technical rept.,
Christopher W. Fairall. 1 Apr 79. 198p Rept no. BDM/M-008-79
Contract N00014-78-C-0204
Availability: Microfiche copies only.

Descriptors: *Meteorological data, Mexico Gulf, Low altitude, *Micrometeorology, *Marine meteorology, Barometric pressure, Dew point, Ocean surface, Data acquisition.
Identifiers: *Panama City(Florida), Ocean temperature, Surface temperatures, Turbulent boundary layer, Profiles, Aerial reconnaisance, Flight paths, Time series analysis.

A preliminary analysis and listing is given of micrometeorological data obtained from aircraft measurements. Thirteen flights were made on ten different days from 26 November 1978 to 13 December 1978. The typical flight duration was approximately three hours. Three types of flight pattern were employed for specific environmental characterization: low-level, constant altitude runs for sea surface temperature maps, spiral ascents and descents for surface-to-altitude profiles, and 'ladder' profiles obtained from level runs of two minutes duration at successively increasing altitudes for marine boundary layer turbulence structure. A printout of the primary variables of interest for each flight is presented as a time series (32 second average). A Similar printout for each ladder profile (a series of two minute averages at constant altitude) is also presented.

AD-A070 962/6GA PC **A03**/MF **A01**
Stanford Univ CA Inst for Plasma Research.
Solar Variability and Terrestrial Weather.
Scientific rept.,
Philip H. Scherrer. Apr 79, 30p
Contracts N00014-76-C-0207, NAS5-24420
Sponsored in part by Grants NO-R-05-020-559 and NSF-ATM77-20580.

Descriptors: *Weather, Solar radiation, Variations, Statistical analysis.
Identifiers: *Solar activity, Solar wind, Climatic changes.

The past four years have seen a growing interest in possible relationships between terrestrial weather and solar or solar wind variability. Most of the work in sun weather (and climate) studies have sought correlations on three time scales: (1) climate changes over hundreds to thousands of years, related to longer term variations in the solar putput, (2) climate changes correlated with the 22-year solar cycle, and (3) weather variations on the scale of a few days, in response to transient solar events. While it has not been conclusively shown that there is a sun-weather connection on any of these time scales, in each case there exists enough supporting evidence to suggest that further study is warranted. (Author)

AD-A070 974/1GA PC **A03**/MF **A01**
Naval Weapons Center China Lake CA
Project Foggy Cloud VII, Warm Fog Dispersal and Prevention (Preliminary Summary),
Roger F. Reinking. Apr 75, 35p NWC-TM-2527, GIDEP-E096-0747
Supersedes Rept. no. GIDEP-E076-0565.

Descriptors: *Fog dispersal, Weather forecasting, *Meteorological data, Naval operations, Sprayers, Flight testing.
Identifiers: Project Foggy Cloud 7 project, Warm fog.

No abstract available.

AD-A071 176/2GA PC **A04**/MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
Evaluation of the Passive Remote Crosswind Sensor.
Research and development technical rept. 31 Jan-8 Mar 78,
Ruben Rodriguez. May 79, 75p Rept no. ERADCOM/ASL-TR-0032

Descriptors: *Crosswinds, *Remote detectors, Meteorological data, Wind velocity, Anemometers, Computer programs, Weather, Statistical analysis, Ranges(Facilities).
Identifiers: Biggs Army Airfield, Fort Bliss(Texas), Texas, Performance evaluation.

Field measurements of integrated path crosswinds were made at Biggs Optical Range, Biggs Army Airfield, Fort Bliss, Texas, during the period 31 January to 8 March 1978 with the passive remote crosswind sensor, a system that measures crosswinds by detecting and analyzing the movement of atmospheric scintillations. Data collected with this sensor were compared to integrated path wind averages measured by the calibrated anemometer array. Presented in this report are X-Y scatter plots, derived weighting functions, analog comparative plots, and sampled analog data. Conclusions and recommendations are made in the last sections. (Author)

NTIS/PS-79/0832/0GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Lightning (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Aug 79, 50p
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Lightning, *Bibliographies, Lightning protection, Electromagnetic interference, Hazards, Thunderstorms, Electromagnetic radiation, Abstracts.

This bibliography cites articles covering aircraft hazards, aircraft safety, radio meteorology, circuit protection, electromagnetic pulses, and electromagnetic radiation. Articles concerning atmospheric electricity and thunderstorms are stressed. (Contains 209 citations)

ORNL/TM-6883 PC **A24**/MF **A01**
Oak Ridge National Lab., TN.
Storms over the METER--ORNL Precipitation Network: The First Six Months.
R. L. Miller, A. A. N. Patrinos, and R. E. Saylor.
Jun 79, 551p
Contract W-7405-ENG-26

Descriptors: Data acquisition systems, Earth atmosphere, *Rain, Thermal pollution, Water vapor, Wind, Chemical effluents, Cooling towers, Diagrams, Environmental effects, Experimental data, Georgia, Monitoring, Thermal effluents, Thermal power plants.
Identifiers: ERDA/500400, ERDA/500200, ERDA/200201, *Inadvertent weather modification, Bowen electric power plant.

For abstract, see ERA citation 04:045365.

PB-298 725/3GA PC **A05**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
A System That Measures Blowing Snow.
Forest Service research paper (Final),
R. A. Schmidt. Oct 77, 86p FSRP-RM-194

Descriptors: *Meteorological instruments, *Snow, Wind(Meteorology), Blowing, Particle size, Visibility, Manuals.
Identifiers: Data acquisition systems.

A snow particle counter was developed and tested for research in the fundamentals of snow transport by wind. Further work created an electronic system that monitors visual range in blowing snow. The system has been applied to interstate highway traffic control. All design and test data are included in this paper, together with shop drawings for fabrication of the sensor, and an operating and service manual for the visual range monitor.

PB-298 738/6GA PC **A05**/MF **A01**
National Oceanic and Atmospheric Administration, Washington, DC. Environmental Data and Information Service.
Mariners Weather Log, Volume 23, Number 3,
Elwyn E. Wilson. May 79, 86p NOAA-79061903
See also Volume 23, Number 2, PB-295 860.

Descriptors: *Storms, *Weather observations, Tropical cyclones, Hurricanes, Ocean waves, North Atlantic Ocean, North Pacific Ocean.

In addition to its regular sections, this issue contains the following articles: Ship response and environmental ship routing; Eastern North Pacific tropical cyclones, 1978; and Central North Pacific tropical cyclones, 1978.

PB-298 817/8GA PC **A02**/MF **A01**
National Weather Service, Salt Lake City, UT. Western Region.

The Depth of the Marine Layer at San Diego as Related to Subsequent Cool Season Precipitation Episodes in Arizona.
Technical memo.,
Ira S. Brenner. May 79, 25p NOAA-TM-NWS-WR-143, NOAA-79070602

Descriptors: *Precipitation(Meteorology), *Marine atmospheres, Weather forecasting, Autumn, Winter, Arizona.
Identifiers: Vertical air currents, San Diego(California).

The relationship between the depth of the marine layer at San Diego, California, and potential precipitation episodes in Arizona during the cool season is studied. It is shown that a marine layer from the surface to at least the 700-mb level is generally necessary for consideration of a subsequent widespread precipitation episode in Arizona. The relationship of the height of this marine inversion to the current vertical motion field is also discussed.

PB-298 836/8GA PC **A07**/MF **A01**
Colorado Univ., Boulder. Inst. of Arctic and Alpine Research.
Studies of Climate and Ice Conditions in Eastern Baffin Island, 1971-73.
Interim rept. Jan 71-Dec 73,
J. D. Jacobs, R. G. Barry, R. S. Bradley, and R. L. Weaver. Mar 74, 131p INSTAAR-OP-9-74
Grant NSF-GV-28218

Descriptors: *Baffin Island, *Sea ice, *Climate, Arctic regions, Spaceborne photography, Glaciers, Broughton Island, Baffin Bay, Davis Strait, Canada.
Identifiers: Boas glacier.

Studies on shorefast ice and climate off eastern Baffin Island during 1971-73 are reported. Ice conditions are mapped from Landsat imagery. Field data on the ice near Broughton Island, N.W.T., including meteorological and oceanographic measurements, are discussed. Mass balance data for the 'Boas Glacier', and synoptic-climatological studies for eastern Baffin Island are also presented.

PB-298 899/6GA PC **A02**/MF **A01**
National Weather Service, Salt Lake City, UT. Western Region.
The Usefulness of Data from Mountaintop Fire Lookout Stations in Determining Atmospheric Stability.
Technical memo.,
Jonathan W. Corey. May 79, 14p NOAA-TM-NWS-WR-142, NOAA-79070601

Descriptors: *Atmospheric motion, Observation, Stability, Indexes(Ratios), Atmospheric temperature, Humidity, Moisture content, Mountains, Thunderstorms, Weather forecasting, California.
Identifiers: *Observation posts, Forest fire control systems.

A representative 'lifted index' of atmospheric stability can be determined using normal RAOB data for the 500-mb temperature and data from morning mountaintop fire lookout stations for the low-level temperature and moisture data as described. Thus, a much more detailed analysis of atmospheric stability than would be available from only RAOB station data can easily be derived. This method has proved to be very useful in summer thunderstorm forecasting in the Redding Fire Weather District and should prove equally helpful in other areas with varying terrain. Also, if communications do not pose a great problem, it would be a fairly simple matter to produce a detailed stability analysis of the entire mountainous West for distribution via RAFAX or AFOS.

PB-298 915/0GA PC **A03**/MF **A01**
National Environmental Satellite Service, Washington, DC. Meteorological Satellite Lab.
Objective Use of Satellite Data to Forecast Changes in Intensity of Tropical Disturbances.
Technical memo.,
Carl O. Erickson. Apr 79, 48p NOAA-TM-NESS-103, NOAA-79070902

Descriptors: *Tropical cyclones, *Weather forecasting, Regression analysis, Synoptic meteorology, Meteorological satellites, Spaceborne photography.

Eighty-nine classified and unclassified tropical disturbances of all intensities (several hundred synoptic 'cases') have been investigated to determine how high-cloud vectors and other satellite data might be used for objective forecasts of changes in intensity. For unclassified (weak) disturbances, a 6-variable discriminator can identify many that are nondeveloping. For the remainder of unclassified disturbances, additional information is needed. For classified disturbances, two modified regression equations have been developed to predict the 24-hr change in windspeed. The equations are derived from operationally available data, and the variables are calculated by a relatively simple numerical program. It appears that introduction of low-level vorticity and the nonlinear advection of vorticity should offer further improvements.

PB-299 046/3GA PC **A05**/MF **A01**
National Weather Service, Silver Spring, MD.
The Nested Grid Model.
Technical rept.,
Norman A. Phillips. Apr 79, 89p NOAA-TR-NWS-22, NOAA-79071307

Descriptors: *Weather forecasting, *Mathematical models, Atmospheric models, Finite difference theory, Performance evaluation.
Identifiers: *Nested grid model.

The nested grid model (NGM) consists of a stereographic hemispheric grid with the option of one or two interior rectangular grids, each of successively smaller area and finer horizontal resolution. The location and number of the vertical sigma levels is flexible, as is the basic horizontal resolution. Second-order accurate finite-difference formulas are used, in a two-step Lax-Wendroff procedure. Special initial treatments are used to reduce spurious gravity waves from the Himalayas, and to insure symmetry about the Equator. Details of the September 1978 state of the model and its numerical procedures are presented, including the representation of latent heat release, small-scale vertical exchange, spatial filtering, grid meshing at boundaries, and data input from the Flattery global analysis system at NMC. (Radiation is not yet included in the NGM.) A brief review of experimental results is presented.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A070 778/6GA PC **A04**/MF **A01**
Ultrasystems Inc Irvine CA Operations Research and Economic Analysis Dept
EDATL Facility Scheduling Problem Research.
Final rept.,
R. J. Egbert, and J. G. Rau. 1 Jun 78, 68p
Contract N00014-77-C-0190

Descriptors: *Naval planning, *Scheduling, Algorithms, Naval shore facilities, Allocations, Efficiency, Data processing equipment, Mathematical programming.
Identifiers: Resource allocation.

This is the final report concerning a research project which focusses on the development of scheduling algorithms and the demonstration of the use of sequencing and scheduling techniques research in the planning and ordering of Naval activities. A specific problem area deals with the scheduling of test activities at Naval test, development and evaluation facilities. For example, there is presently under construction the Electronics Development and Testing Laboratory (EDATL) which has the mission 'to provide facilities and technical support to permit complete integration and simultaneous multi-platform testing of total electronic command control, communications, surveillance, intelligence, and ocean surveillance systems in an electromagnetically shielded and controlled environment.' The EDATL will contain a core of ADP equipment available for use by projects on a resource sharing basis. To fully utilize the EDATL facilities and equipments, scheduling techniques that accurately predict workloads need to be developed and implemented. This suggests that perhaps the allocation and prediction of dedicated facility/equipment requirements, and the movement of equipments from dedicated to common areas and vice versa should be scheduled on a priority basis. Proper scheduling will keep track of equipment availabilities projected over time, so that effective, non-wasteful use is made of the facility.

AD-A070 894/1GA PC **A07**/MF **A01**
Forecasting International Ltd Arlington VA
A Study of USCG Surveillance Requirements Over the Next 25 Years and Development of A Surveillance R and D Program. Volume I.
Final rept. Oct 78-Apr 79,
M. J. Cetron, C. F. McFadden, O. H. Landua, S. E. Sugarek, and R. A. Ferraiolo. Apr 79, 126p
USCG-D-10-79-VOL-1
Contract DOT-CG-836036-A
See also Volume 2, AD-A070 895.

Descriptors: *Surveillance, Technology forecasting, Coast Guard research, Research management, Technology transfer, Remote detectors, Military planning, Delphi techniques, Methodology.

The objectives of this study were to provide a multimission assessment of possible Coast Guard surveillance requirements over the next 25 years in 5-year increments; and to develop a Coast Guard surveillance R and D program. The recommended program was to consider likely future demands on USCG surveillance capabilities and develop a time-phased program which would allow the Coast Guard to respond to changing demands in a timely fashion. Thus the first phase of the analysis concentrated on identifying and assessing the impact of future trends and events which could affect surveillance requirements. A list of potential events relevant to Coast Guard surveillance requirements was developed. These major events were then evaluated via a Delphi, with the participation of experts in a variety of appropriate fields. Once the relative importance of each surveillance requirement was established, a survey of current and future available technology was undertaken, to determine current development status, current level of application, pace of development, efficacy in meeting each surveillance requirement. Using cross-relevance matrices, a gap analysis was conducted to determine the efficacy of the technologies, as currently applied and potentially available, in meeting the most important surveillance requirements. The result was a determination of the relative importance of the technologies for Coast Guard research and development.

AD-A070 895/8GA PC **A07**/MF **A01**
Forecasting International Ltd Arlington VA
A Study of USCG Surveillance Requirements Over the Next 25 Years and Development of a Surveillance R and D Program. Volume 2. Appendices.
Final rept. Oct 78-Apr 79,
M. J. Cetron, C. F. McFadden, O. H. Landua, S. E. Sugarek, and R. A. Ferraiolo. Apr 78, 146p
USCG-D-10-79-VOL-2
Contract DOT-CG-836036-A
See also Volume 1, AD-A070 894.

Descriptors: *Surveillance, Technology forecasting, Coast Guard research, Research management, Technology transfer, Remote detectors, Military planning, Mathematical models, Information processing.

Contents: Trends Affecting Future Coast Guard Surveillance Requirements; Event Impacts on Program Activities; Consensor Information and Instructions; Results of the Modified Delphi Conference; Surveillance Information Element Weights by Program Activity; Surveillance Requirements Model Inputs; Surveillance Requirements Model Results by Operating Program; Detailed Surveillance Requirements in Rank Order; Surveillance Requirements Model: Sensitivity Analysis; and Surveillance Technologies Model.

AD-A070 952/7GA PC **A06**/MF **A01**
Massachusetts Inst of Tech Cambridge Operations Research Center
Organization Design.
Technical rept.,
Arnoldo C. Hax, and Nicolas S. Majluf. May 79, 104p Rept no. TR-163
Contract N00014-75-C-0556

Descriptors: *Organizations, Theory, Hybrid systems, Functional analysis, Management planning

and control, Decision making, Commerce, Corporations, Industries.
Identifiers: *Organization theory.

The purpose of this paper is to review the major concepts underlying the proper design of an organization structure for a business firm. It provides a review of the various managerial processes to support decision making in an organization. It discusses the major organization archetypes (functional, divisional, and matrix organization forms); presents a brief historical overview of various organization theories; and finally concludes with recommendations of steps to be undertaken in the design of an organization structure. (Author)

HRP-0028529/6GA Not Available NTIS
West Virginia Coll. of Graduate Studies, Institute.
Emerging Problems of Citizen Participation.
D. Stephen Cupps. 1977, 10p
Pub. in Public Administration Review v37 n5 p478-487 Oct 77.

Descriptors: *Benefit cost analysis, Cost effectiveness, Data analysis, Data processing systems, Data processing, Guidelines, Health care costs, Health care, *Health planning, Measurement, Methodology, Policies, Political science, Quality assurance.

Problems associated with the growth of the citizen participation and public interest movements are analyzed. Despite impressive accomplishments, the public interest movement carries with it a number of disquieting trends with implications for administrators at every level of government. It is argued that citizen groups, environmentalists, and consumers sometimes pressure agencies to act precipitously in behalf of the public, that administrators should not give way to the temptation to ignore long-range, less visible, problems which may actually be of greater significance than highly publicized issues, and that the administrator's goal should be a creative blend of considered professional judgment, an effective program implementation strategy, and adequate opportunities for citizen participation. By ignoring cost-benefit calculations, public interest advocates greatly oversimplify complex issues. For example, occupational health and safety disputes are described as choices between the pursuit of industry profits at the workers' expense, on the one hand, and freedom from exposure to any levels of potentially hazardous substances on the other. For the policymaker, however, the question is not whether to be concerned with public health, but rather how much it will cost and how much we are willing to pay, in terms of values, goals, and policies.

PB-298 368/2GA PC **A02**/MF **A01**
California Univ., Irvine. Public Policy Research Organization.
Chief Executives, Local Government, and Computers,
Kenneth L. Kraemer, James N. Danziger, and William H. Dutton. Aug 75, 25p NSF/RA/G-75/087
Grant NSF-GI-41038
See also report dated Aug 75, PB-254 354.

Descriptors: *Local government, *Public administration, *Attitude surveys, *Management information systems, Data processing, Information systems, Information retrieval, Technology assessment, Urban areas.
Identifiers: Urban information systems, URBIS project.

The report is part of a major research project called URBIS (Urban Information Systems) which is concerned with the evaluation of information technology in local government. The executive survey was conducted in early 1975, covering a total of 713 U.S. local governments, including all cities with more than 50,000 people and all counties with more than 100,000 people. Responses were received from more than 80 percent of the governments surveyed, and the responses indicated that nearly all of the questionnaires were completed or reviewed by the chief executive. This report presents and explores the opinions regarding computers and EDP by these chief executives, including mayors, managers, county executives, and board chairmen. It covers their perceptions of the impact and value of computers and data processing, both now and in the future, their support for continuing and expanding computer services, their own involvement in EDP, the kinds of problems their government has experienced with computing, and their views on selected policy issues like privacy or the intergovernmental transfer of automated systems.

PB-298 532/3GA PC **A08**/MF **A01**
Westinghouse Electric Corp., Philadelphia, PA.
Research on Productivity Measurement Systems for Administrative Services: Computing and Information Services. Volume 2. Final Technical Report.
Final rept.,
Lewis F. Hanes, and Charles H. Kriebel. Jul 78, 153p NSF/RA-780514
Grant NSF-APR75-20546
See also Volume 1, PB-298 257. Prepared in cooperation with Carnegie-Mellon Univ., Pittsburgh, PA. Graduate School of Industrial Administration.

Descriptors: *Information services, *Computation, *Productivity, *Measurement, Economic analysis, Information systems, Efficiency, Effectiveness, Administrative support, System analysis, Performance standards, Manpower utilization.
Identifiers: Input output analysis, Information dissemination.

A program to develop and implement productivity models and measurement techniques is described. The effort was a basic and exploratory research study to develop models and measures for use with computing and information services (C and IS) activities. Goals were to develop a theory or conceptual framework for productivity measurement of the C and IS function, to pilot test the approach through empirical analyses at field sites, and to evaluate the results and report the conclusions. Productivity was considered from two perspectives: the efficiency with which C and IS input resources are converted into output products and services and the effectiveness of users as a result of having utilized these outputs. Productivity models and measurement techniques were developed and tested that considered both efficiency and effectiveness, only efficiency, and only effectiveness. Included are: (1) an overview of an approach based on conventional economic theory and empirical analysis; (2) a total factor productivity approach to efficiency measurement; (3) approaches developed for the assessment of effectiveness; and (4) dissemination and utilization of research results.

PB-298 550/5GA PC **A04**/MF **A01**
General Accounting Office, Washington, DC. Program Analysis Div.
An Analysis of the Effects of Indexing for Inflation on Federal Expenditures.
Report to the Congress.
15 Aug 79, 70p* PAD-79-22

Descriptors: *National government, *Expenses, *Inflation(Economics), *Cost indexes, *Escalation clauses, Economic impact, Cost control, Budgeting, Financial management, Federal assistance programs, Welfare, Fringe benefits, Accounting, Economic analysis.

Over half of all Federal expenditures are indexed for inflation. Indexed expenditures increase automatically when inflation occurs. For a number of reasons, Federal expenditures which are indexed have been increasing more rapidly than total Federal spending and much more rapidly than inflation. Given the large and growing share of the budget accounted for by indexed programs, it would be difficult to bring Federal spending under control without some check on indexing. However, such a check should be weighed against its possible consequences and its effectiveness in an overall anti-inflation program.

PB-298 551/3GA PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Financial and General Management Studies Div.
Weaknesses in Servicing and Accounting for Home Mortgages Held by HUD.
Report to the Congress.
16 Aug 79, 29p FGMSD-79-41

Descriptors: *Accounting, *Services, *Financing, *Houses, National government, Liabilities, Real property, Fixed investment, Payment, Government policies, Financial management, Records management, Auditing.
Identifiers: *Department of Housing and Urban Development, *Mortgages, Default debtors, Financial problems.

The Department of Housing and Urban Development services and accounts for mortgages valued at over $151 million. These mortgages were either bought from commercial lenders to prevent foreclosure on defaulted mortgagors experiencing temporary financial problems or resulted from the Department selling property it had previously acquired. The Department does not provide adequate incentives to encourage these mortgagors to pay off thier debts. Rather than helping them eliminate or reduce their delinquencies, the Department has allowed many mortgagors to fall so far behind that repayment may be impossible. During GAO's review, the Department made a number of changes to improve its accounting and servicing activities. Additional changes are needed, however, to reduce the delinquency rate and to promptly collect funds due the Government.

PB-298 552/1GA PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Procurement and Systems Acquisition Div.
Implementation of Major System Acquisition Process--A-109--Is Inconsistent Among Civil Agencies.
Report to the Congress.
14 Aug 79, 82p PSAD-79-89

Descriptors: *Government procurement, *Acquisition, *Government policies, National government, Procurement, Cost overruns, Purchasing, Expenses, Cost engineering, Contract Administration, Systems analysis, Services, Product development, Production, Budgeting, Objectives.

The Office of Management and Budget's Circular A-109 prescribes how major systems are to be acquired. A-109 is consistent with the Commission on Government Procurement recommendations and is expected to reduce cost overruns and diminish the controversy of whether new systems are needed. GAO reviewed its implementation in four civil agencies and found progress has been slow and some agency directives or acquisition processes are inconsistent with A-109's objectives. Reforms are needed.

PB-298 631/3GA PC **A09**/MF **A01**
Urban Inst., Washington, DC.
The Regulatory Processes and Effects Project.
Final rept.,
Joe N. Nay, and Warren Frederick. Jun 79, 183p
NBS-GCR-ETIP-79-65
Contract NBS-7-35822

Descriptors: *Regulations, *Technology innovation, *Industries, Government policies, Impact, Incentives, Decision making, National government, Environments, Health, Utilities, Commerce, Nuclear energy, Research.
Identifiers: Industrial technology, Agencies, Research and development.

The document is a summary of progress on the Center for Field Method's (ETIP) Regulatory Processes and Effects Project (RPE). The RPE project is working to analyze the effects of changes in regulatory processes on industrial innovation. Chapter I provides an overview of the project. Chapter II contains brief descriptions of each of ten regulatory situations included in the first year's work. The regulatory contexts and experimental changes are described together with a report on progress, implications of the work to date, and a listing of possible next steps. The final chapter describes implications for the future RPE project work. A number of detailed reports on specific regulatory situations are referenced in Chapter II.

PB-298 732/9GA PC **A06**/MF **A01**
Mathematics and Computation Lab., Washington, DC. Information Science Div.
Zero Base Budget Software.
Final rept.,
Nathan J. Ray. Jun 79, 118p* GSA/FPA/MCL-TM-283

Descriptors: *Budgeting, Computer programming.
Identifiers: *Zero base budgeting, Computer software, PDP-11/45 computers, STAMOS system.

This manual contains descriptions of software modules which may be used to facilitate the physical preparation of budgets using the Zero Base Budget concept. The software includes facilities for entering and manipulating decision packages, rank tables, staffing tables, and object class tables. The manipulation facilities include the capability to obtain resource summaries by organizational elements or by program area. The Zero Base Budget Software executes on the PDP 11/45 computer under control of the STAMOS operating system.

PB-298 782/4GA PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Logistics and Communications Div.
Facilities Acquisition and Management Issues.
1 Aug 79, 37p LCD-79-327

Descriptors: *Office buildings, *Military facilities, *United States Government, Operating costs, Renovating, Maintenance, Management, Public buildings, Real property.

The Federal Government owns over $50 billion worth of facilities to house its employees and their activities - primarily large military complexes and civilian office buildings, warehouses, and other structures. This study examines the principal legal, economic, social, technical and managerial issues in the Government's acquiring, operating, and disposing of these facilities. It emphasizes congressional interest and needs, and other major problems requiring GAO attention.

PB-298 793/1GA PC **A03**/MF **A01**
National Science Foundation, Washington, DC. Engineering and Applied Science.
Impact Assessment of the Intergovernmental Programs: A Panel Report,
Mar 78, 31p NSF/RA-780120A
Supersedes PB-283 020.

Descriptors: *Local government, *Technology innovation, *Management, State government, States(United States), Government policies, Project management, Management methods, Resources, Technical assistance.

An assessment panel reviewed ten NSF-funded projects designed to assist state and local governments in strengthening their institutional capacity for using scientific and technological resources in their policy formulation, administrative management, and program operations or in testing strategies for overcoming barriers to innovation. In all projects the effectiveness of the selected capacity-building strategies was tested in an effort to solve real-world problems. New institutional arrangements were demonstrated to help state and local agencies to better utilize their own resources or to capitalize on resources found elsewhere. Some project impacts appeared substantial, while others were marginal. A major finding of the panel was that for a political setting which is almost constantly changing, the initial design of a given project may serve to constrain flexibility and innovation. NSF must develop ways of recognizing the merit and desirability of mid-course changes that do not injure the spirit of an initial agreement.

PB-298 796/4GA PC **A05**/MF **A01**
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
Southeastern Forum on Appropriate Technology, Held at Atlanta, Georgia on September 17 and 18, 1978.
Final rept.,
Jeffrey S. Tiller, David S. Clifton, Jr., and Robert A. Cassanova. Apr 79, 98p GIT-B-519-F, NSF/RA-790007
Grant NSF-ISP78-22994

Descriptors: *Technology assessment, *Southeast Region(United States), *Research, *Meetings, Technological intelligence, Planning, Public opinion, Technology transfer, Research management, Projects, Objectives.
Identifiers: Research needs.

The first section describes the background and purpose of the forum. A discussion of the definition of appropriate technology is included. The second section describes the development of the structure and agenda for the Southeastern Forum. The final section discusses the results of the forum and proposes a strategy for NSF to follow in an appropriate technology program. A set of appendices includes discussions of the specific inputs received from participants, preliminary results of a survey of appropriate technology activities in the Southeast and a list of attendees at the Southeastern Forum on Appropriate Technology.

5B. Documentation and Information Technology

AD-A070 581/4GA PC **A05**/MF **A01**
Office of Naval Research Scientific Liaison Group APO San Francisco 96503
ONR Tokyo Scientific Bulletin. Volume 3, Number 3. July - September 1978,
Bruce J. McDonald, and Eunice Mohri. Sep 78, 81p
See also Volume 3, Number 1, AD-A058 481.

Descriptors: *Scientific literature, Military publications, Research ships, Biophysics, Navy, Japan, Cancer, Computer aided design.

This is a quarterly publication presenting articles covering recent developments in Far Eastern (particularly Japanese) scientific research. It is hoped that these reports (which do not constitute part of the scientific literature) will prove to be of value to scientists by providing items of interest well in advance of the usual scientific publications. The articles are written primarily by members of the staff of ONR Tokyo, with certain reports also being contributed by visiting stateside scientists. Occasionally a regional scientist will be invited to submit an article covering his own work, considered to be of special interest. (Author)

AD-A070 801/6GA PC **A02**/MF **A01**
System Development Corp Santa Monica CA
Deductive Planning and Pathfinding for Relational Data Bases,
Charles Kellogg, Philip Klahr, and Larry Travis. 1978, 22p
Contract N00014-76-C-0885

Descriptors: *Data management, *Information retrieval, Data bases, Searching, Computer applications, Interactions, Flow charting, Networks, Semantics.
Identifiers: *Data base management systems, DADM system.

Inference planning techniques have been implemented and incorporated within a prototype deductive processor designed to support the extraction of information implied by, but not explicitly included in, the contents of a relationally structured data base. Deductive pathfinding and inference planning are used to select small sets of relevant premises and to construct skeletal derivations. When these skeletons are verified, the system uses them as plans to create data-base access strategies that guide the retrieval of data values, to assemble answers to user requests, and to produce proofs supporting those answers. Several examples are presented to illustrate the current capability of the prototype Deductively Augmented Data Management (DADM) system. (Author)

AD-A071 001/2GA PC **A06**/MF **A01**
Harry Diamond Labs Adelphi Md
Guides for ERADCOM Formal Reports.
Special publication,
Barbara S. Collier, and E. Ellen Jones. Mar 79, 114p Rept no. HDL-ESP-79-1

Descriptors: *Technical writing, Army research, Electronics, Instruction manuals, Reports, Preparation, Grammars, Editing, Printing.
Identifiers: Style manuals.

A stylebook has been produced to assist authors, editors, and production personnel in the preparation of scientific and technical reports. Thus, guidelines are directed specifically to the different groups who write, edit, type, lay out copy, and prepare reports for the printer. Part I (which will interest production personnel) describes and illustrates mechanical aspects of report preparation, such as format, treatment of tables and figures, pagination, classification markings, and proper referencing. Part II (which will be most helpful to authors and editors) addresses standards of style, grammar, and usage. Also included is an annotated bibliography, which lists many of the most easily obtainable and well-known references for grammar, correct usage, and technical writing. Some of the information included was summarized from the applicable Army regulations that govern the preparation of scientific and technical reports; other information was adapted from established editorial policies that have been adopted or approved by activities of the Electronics Research and Development Command (ERADCOM). Although these guidelines were compiled primarily for the ERADCOM activities, they are applicable to the production of any formal scientific and technical reports that are issued by or for the Department of Defense.

AD-A071 005/3GA PC **A06**/MF **A01**
RAND Corp Santa Monica CA
An Introduction to the ISIS Interactive Information System.
Interim rept.,
Herbert J. Shukiar, Charles H. Bush, and Robert C. Gammill. Apr 79, 104p Rept no. RAND/R-2435-AF
Contract F49620-77-C-0023

Descriptors: Data storage systems, Data bases, Data management, Interactions, Information systems, Tactical air control systems, Crisis management, Tactical air support, Missions, Digital computers, Instruction manuals, Time sharing.
Identifiers: *ISIS system, PDP-11 computers, Data base management systems, Interactive systems, PDP-11/70 computers.

This report describes in a tutorial manner ISIS, an interactive data base management system developed on the PDP11 computer under the UNIX timesharing system. ISIS, designed for computer-naive users, uses an English-like command language to give the use the ability to view, modify, and otherwise reorganize his data base. ISIS operates on data bases of modest size, exploiting the unique characteristics associated with such data bases. The tutorial focus is tactical command and control, but ISIS is more generally applicable. The report introduces the ISIS command language in stages, and the user with access to Rand's PDP11/70 can try ISIS out on the command and control data base utilized in the report. The report also discusses the system development philosophy adopted during ISIS implementation.

ED-162 656 Not available NTIS
INFORMEDIA, Pearl River, NY.
The Oceans: New Frontier,
Mary Robinson Sive. 1978, 23p
Pub. in Jnl. Media Monitor: The Timely Guide to Learning Resources; v2 n1 1978. Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, MF$0.83 Only, Plus Postage. Also available from INFORMEDIA, Box 1020, Pearl River, NY. 10965, ($2.50).

Descriptors: Bibliographies, Educational resources, Elementary education, Information sources, *Instructional materials, *Oceanology, Reference materials, Secondary education.

This annotated guide to current marine education resources is arranged in three sections--secondary, elementary, and professional--and indexed by subject. It lists 287 selected free-loan films, sale films, audio and video recordings, film loops, filmstrips, study prints, maps, charts, and other software, including government publications, reference books and curriculum guides. Source, release date, sale and rental price, format data, grade level, contents and references to reviews in professional journal are noted for each title. Addresses of 90 vendors are listed separately at the end.

ED-162 665 Not available NTIS
Maine Univ. at Orono. Raymond E. Folger Library.
Finding a Book: The Card Catalog. Library Instruction Series. Unit II,
Clara Kamerling Flower. 1977, 53p
For related documents, see IR 006 698-701.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$3.50, MF$0.83 Plus Postage.

Descriptors: Autoinstructional aids, Classification, Dictionary catalogs, Learning modules, *Library instruction, Library skills, *University libraries.

The second of three library skills modules for college students, this unit explains the card catalog, call numbers, filing rules, types of catalog cards and the information they relate, and Dewey and Library of Congress classification systems. The library location charts and how they are to be used are also discussed. Included with the unit are six tests which are used to evaluate student achievement after completion of the module.

ED-162 666 Not available NTIS
Maine Univ. at Orono. Raymond H. Folger Library.
Finding an Article: Indexes and Abstracts. Library Instruction Series. Unit III,
Clara Kamerling Flower. 1977, 29p
For related documents, see IR 006 698-701.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$2.06, MF$0.83 Plus Postage.

Descriptors: Autoinstructional aids, Indexes(Locaters), *Library instruction, Library skills, Newspapers, Periodicals, Scholarly journals, *University libraries.

The last of three library skills modules for college students, Unit III provides definitions of periodicals, indexes and abstracts, as well as discussion of how to select the appropriate index or abstract, how to interpret a citation, and how to locate bound journals, microfilms, and current issues of journals in the library. Copying and borrowing regulations for magazines are explained. How to use newspapers and their indexes is the topic of the concluding exercise. Included with the unit are six tests which are used to evaluate student achievement after completion of the module.

ED-162 668 Not available NTIS
Prize-Winning Essays. Nine Award-Winners Selected by the Citizens Advisory Committee.
Apr 78, 21p
A collection of prize-winning essays selected for the Massachusetts Governor's Conference on Libraries and Information Services.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$1.67, MF$0.83 Plus Postage.

Descriptors: Awards, Elementary school students, *Essays, Junior high school students, *Libraries, Secondary school students.

This collection of nine essays includes three from each of the contributing groups--elementary school, middle school, and high school students. Titles include 'Libraries for the People and by the People,' 'How the Library Helps Us,' 'Improvements Since the Library Company of Philadelphia,' and 'Today's Library--A Place for All Seasons.'

ED-162 669 Not available NTIS
New York State Dept. of Education, Albany. Div. of Library Development.
A Directory of Library Systems in New York State.
1977, 106p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$6.01, MF$0.83 Plus Postage.

Descriptors: College libraries, *Directories, Library networks, Public libraries, *Special libraries, University libraries.
Identifiers: *New York.

This directory, compiled from information supplied by directors of the systems, and state departments or agencies administering library programs, contains listings of the Reference and Research Library Resources Systems in New York state. They are arranged regionally and alphabetically with each section containing information on the reference and research libraries; the public library systems; and state institution libraries. Information provided for each includes the name of the director, address of the system, telephone and teletype numbers, year of establishment, names of principal staff and of the president of the system board of trustees, name of each county participating in the system, and the number of member libraries. Addresses are also given for all member institutions and libraries. Maps indicating locations of the Reference and Research Library Resources Systems and the Public Library Systems are included, along with an index of these systems by county.

ED-162 670 Not available NTIS
Syracuse Univ., NY.
Resources for Educators of Adults: Periodicals, Newsletters and Indexes in E.S. Bird Library and the Clearinghouse of Resources for Educators of Adults,
Alexander N. Charters. Jun 78, 16p
For related documents, see IR 006 756-758.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$1.67, MF$0.83 Plus Postage.

Descriptors: *Adult education, *Bibliographies, Indexes(Locaters), Information sources, Library collections, Newsletters, *Periodicals.
Identifiers: Clearinghouse of Resources for Educators of Adults, *Syracuse University E S Bird Library NY.

This bibliography of newsletters, periodicals, and indexes useful to adult educators includes periodicals held at Bird Library and the Clearinghouse of Resources for Educators of Adults (CREA), both at Syracuse University; newsletters held by CREA; and indexes held by Bird. The bibliography is divided into four sectons: (1) the Bird Library periodical list containing entries alphabetically by title, and indicating location, frequency, date of first issue and date of first issue at Bird, and call number; (2) periodicals held by CREA listed alphabetically by title with call number; (3) newsletters listed alphabetically by title with call number; and (4) indexes listed alphabetically by title, with date of first issue at Bird, call number and location, and INBK code number.

ED-162 671 Not available NTIS
Syracuse Univ., NY.
Resources for Educators of Adults: Acquisition List, Pamphlet File at E.S. Bird Library,
Alexander N. Charters. Jun 78, 109p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$6.01, MF$0.83 Plus Postage.

Descriptors: *Adult education, *Bibliographies, Library collections, Pamphlets, Subject index terms.
Identifiers: *Syracuse University E S Bird Library NY, Vertical file.

This document reproduces the adult education listings in the Syracuse University Bird Library Pamphlet File. All entries are classified under the subject Education--Adult, with each item listed alphabetically by title under one or more of the descriptive subject headings. One update listing, which is organized the same way, is also included. A list of the descriptive headings and sub-headings utilized in the pamphlet file is provided.

ED-162 672 Not available NTIS
Syracuse Univ., NY.
Resources for Educators of Adults: The Paul Hoy Helms Library in Liberal Adult Education,
Alexander N. Charters. Jun 78, 57p
For related documents, see IR 006 756-758.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$3.50, MF$0.83 Plus Postage.

Descriptors: *Adult education, *Bibliographies, Books, Classification, Independent study, Liberal arts, Library collections.
Identifiers: *Syracuse University E S Bird Library NY, *Syracuse University Paul Hoy Helms Library NY.

This bibliography of the complete holdings of the Paul Hoy Helms Library, now incorporated in the Bird Library collection at Syracuse University, contains books chosen by faculty and students with the intention of furthering adult education and independent study. It is organized by Library of Congress and Dewey Decimal Classification numbers with each entry includng author(s), title, publisher, place of publication, and date. Subject headings include philosophy, psychology, religion and theology, history, the social sciences, political science, law, education, fine arts, architecture, language and literature, and fiction.

ED-162 673 Not available NTIS
Planned Parenthood Federation of America, Inc., New York.
A Family Planning Library Manual,
Blanche Horowitz. 1975, 89p
Katherine Dexter McCormick Library, Planned Parenthood Federation of America, Inc., 810 Seventh Avenue, New York 10019 ($5.00).
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, MF$0.83 Only, Plus Postage.

Descriptors: Family planning, Library administration, *Library technical processes, Manuals, Population education, *Special libraries.

This manual provides a concise and comprehensive 'how to' guide to starting and maintaining a family planning/population library. In addition to the step-by-step procedures necessary for acquiring and organizing book and non-book material, a classification scheme is presented for providing documents, articles, pamphlets, and books with numbers for easy filing and retrieval. This classification system is used by the library network of the Planned Parenthood Federation of America and has been adopted by other family planning libraries as a helpful method of access to holdings. Sections of the manual describe how to select, order, and process books and how to set up a card catalog; how to select and order periodicals, audiovisual and vertical file materials; actual physical aspects of the vertical file; and how to handle newspaper clippings and journal articles. Other topics of interest to librarians include advice on library policy, staff, space, equipment, and supplies. A subject index with the classification number for each subject, and a glossary of family planning terms are included.

ED-163 890 Not available NTIS
Maryland State Dept. of Public Safety and Correctional Services, Baltimore.
Inmate Informational Needs Survey.
Final rept.,
Brenda Vogel. Feb 76, 74p
Prepared in cooperation with Maryland State Dept. of Education, Baltimore. Div. of Library Development and Services.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$3.50, MF$0.83 Plus Postage.

Descriptors: Data analysis, Data collection, Information dissemination, *Information needs, Information sources, Institution libraries, Needs assessment, *Prisoners, Questionnaires, Surveys, Tables(Data).

A survey was conducted to identify the information needs of a five percent sample of men and women incarcerated in seven Maryland State Correctional Facilities for use in planning relevant library services to this population. Findings indicated a lack of basic information concerning rules for correct institutional behavior, with one third of the sample indicating that materials on rules were outdated, unintelligible, and inapplicable. While almost all inmates knew of the library, classes, classification counselors, and social workers, many found it difficult to communicate with staff regarding these information sources, and tremendous delays were reported on information requests and institutional feedback. Such delays led to more confusion, and less confidence, in staff and officials. Although access to libraries and classes is greater than to counselors and social workers, the former were criticized for not fulfilling information needs: the library lacked updated legal materials, law books, and academic reference materials. A strong desire was expressed for information concerning family services, including better communication linkages with families, information on available family service supports, and arranging for these services, as well as information, skills, and assistance with vocational planning and training. The questionnaire utilized for the survey and a tabulation of the responses are appended.

ED-163 893 Not available NTIS
Temple Univ., Philadelphia, PA. Univ. Libraries.
Temple University Libraries in the Mid-Seventies: A Status Report,
Joseph Z. Nitecki. 1977, 51p

Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$3.50, MF$0.83 Plus Postage.

Descriptors: Budgets, Library administration, Library collections, *Library services, Library technical processes, Organization, Personnel, Tables(Data), Trend analysis, *University libraries.
Identifiers: *Temple University PA.

Present central library operations are discussed in terms of emerging needs and possible direction for future development. Library objectives include acquiring and organizing relevant records of knowledge, and providing satisfactory information service standards. Issues relating to objectives include the library's involvement in planning and developing educational programs, support of programs offered, and a well selected professional staff, strong in subjects relevant to library coverage and involved in continuing education. Library organization and structure are concerned with the centralization of library services within the university, and the functional arrangement of activities within the library. At present, Temple's library structure is a combination of centralized and decentralized services. Issues involving personnel are consultative management, professional self-governance, unionization, and affirmative action policies. The library's budget recommendations are based on a balanced budget principle, and library department heads' participation. Collection development is based on stimulus response buying and a system approach. Gradual computerization is taking place with a fully automated circulation system, OCLC, microforms, and semi-automated interlibrary loan. Future issues include cooperation and networking within the profession; cooperation and coordination within the University; and structural reorganization, development of long-range personnel programs, continuing automation, and additional library space.

ED-163 897 Not available NTIS
National Library of Australia, Canberra.
Progress in UNISIST Activity: The First Three Years of the UNISIST Programme in Australia, 1974-77.
Network Study no. 8.
1978, 33p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, MF$0.83 Only, Plus Postage.

Descriptors: Agriculture, Development, Financial support, Industry, *Information networks, Information services, Interagency cooperation, Library education, *National libraries, On line systems, Organization, Trend analysis.
Identifiers: *Australia, *Scientific and technical information, UNISIST.

This paper reprints the Australian report to UNISIST, the World Science Information System, whose objective is the development of national, regional, and international scientific, technological, industrial, and agricultural information policies, infrastructures, and services. It represents a full statement of the National Library's services and roles relating to UNISIST, which include: (1) designation as the Australian focal point for UNISIST; (2) appointment of a scientific and technological services enquiry committee examining the problems of dissemination and access; (3) appointment of advisory committees to help identify nationwide needs and encourage voluntary cooperation between all elements in the national library-based information system; (4) designation of over $1 million to undertake feasibility studies for the establishment of ALBIS (Australian Library-Based Information System); and (5) issuance of further specialized reports on the need for library and information services. UNISIST and all other operational activities of the National Library receive advice from an advisory committee that links government and non-government bodies and ensures that national services respond to national needs. Services offered in fulfillment of nationwide needs include access to overseas data bases, cooperation in the development of library science within Australia, and regional library cooperation.

ED-163 898 Not available NTIS
New York Governor's Commission on Libraries, Albany.
Getting It All, Saving It All: Some Notes By an Extremist. Position Paper on Functions and Services,
William Kennedy. Mar 78, 31p
Position paper prepared for the New York State Governor's Conference on Libraries; Response prepared by Mary Cassata.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$2.06, MF$0.83 Plus Postage.

Descriptors: Equipment, Fiction, Films, *Library collections, Library role, Microfilm, *Needs, Newspapers, Trend analysis, *User satisfaction(Information).

Library users want access to it all--whatever they need, whenever they need it, without restrictions because of content. This library user suggests that libraries should preserve and provide the novel, old newspapers, pop culture, and films. Financing preservation programs for old newspapers is needed for tabloids as well as the Times. These are also aspects of our culture, they should be preserved and provided. The State Library should provide films for enjoyment as well as for research. There should also be a redesign of microfilm machines, an increase in filmscript holdings, and spoken language records, and a rescheduling of library hours to better conform to user needs. A response to this opinion paper indicates that libraries must understand user needs in terms of individuals. Differences in the perception of the printed word, the live event, the televised program, and the audio tape record suggest that all forms of media are essential in libraries. The library's future role will depend upon its ability to fuse new services and new clientele, via a variety of means.

ED-163 899 Not available NTIS
Input, Output, Throughput and Kaput. Position Paper on Technology. Response Prepared by Teresa Strozik,
Walter Lowen, and Rowan A. Wakefield. Mar 78, 23p
Position paper and response prepared for the New York State Governor's Conference on Libraries.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$1.67, MF$0.83 Plus Postage.

Descriptors: Futures(of Society), Information needs, Information processing, Information services, *Libraries, On line systems, Technology, *Trend analysis.

A review of the history of libraries from the viewpoint of a speaker in the year 1080 describes the opposing trends of a shift of human values toward individuality and diversity, while technology was becoming more uniform. Man-computer relationships steadily replaced people-to-people relationships. While the cost of contact services rose, technological advances brought electronic service costs down. By 2030, most of one's time was spent putting information in or taking it out of communication devices. Information needs increased but libraries could not keep up. Huge data banks made retrieval inefficient. To combat these dehumanizing, and unfulfilling trends, people shifted back toward informal information exchange networks, browseries, and specialty information libraries. The response to this position paper argues that rather than having a dehumanizing effect, the computer is leading the consumer society away from mass-produced homogeneity. Technological intercommunication including teleconferencing is increasing leisure time. The symbiotic person/computer relationship will free the person for human interaction, development, and creativity. Rather than a schism between library science and information science people, librarians should act to utilize information science to further the needs of its own development.

ED-163 900 Not available NTIS
New York Governor's Commission on Libraries, Albany.
Resource Sharing in New York State's Library Systems: A User's Perspective. Response prepared by Frances Clark,
Timothy W. Costello. Mar 78, 27p
Position paper and response prepared for the New York State Governor's Conference on Libraries.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$2.06, MF$0.83 Plus Postage.

Descriptors: Libraries, Library cooperation, *Library networks, Library services, Library technical processes, Needs assessment, Regional cooperation, *Regional planning, Shared services, State aid, User satisfaction(Information).
Identifiers: *Access to information, New York.

In order to provide users with increased access to information and recreational materials, all libraries should be included in shared resource planning with the state providing incentive funding. The State Education Department would encompass all libraries, museums, botanical, and zoological entities to promote cooperative, imaginative library use. The state should be organized in library regions, establishing a network to increase access. Cross system possibilities include: (1) joining school and public libraries, although resource interchange rather than combination might prove more beneficial; (2) community access to university libraries; (3) cross-registration; (4) cooperative technical processing, further expedited by advanced technology; and (5) the development of a complete union catalog. Libraries could match hours with user needs and develop programs of operations research. Obstacles to regional development include jurisdictional questions, possible impeding laws, and scarcity of funds.

ED-163 901 Not available NTIS
New York Governor's Commission on Libraries, Albany.
Governing and Financing Libraries in New York State: Position Paper on Finance and Governance,
Edward C. Sullivan. Mar 78, 23p
Position paper prepared for the New York State Governor's Conference on Libraries; Response prepared by John Cory.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$1.67, MF$0.83 Plus Postage.

Descriptors: Federal aid, *Financial support, Futures(of Society), *Governance, Incentive grants, *Libraries, Library administration, Library networks, Regional libraries, State legislation.
Identifiers: *Access to information, New York.

In order to provide a structured program for improved access to New York state libraries, legislation is being developed to establish nine regional library systems funded completely by the state and including public, school, and reference and research library resources systems. Each regional system will be governed by a Board of Directors, appointed by the Education Commissioner from nominees proposed by the regional library system. Component systems will retain their own governance structure. Per capita funding may not be appropriate because the regional systems do not work directly with library users. Local sponsor incentive aid may also be ineffective since local governments are often incapable of increased contributions, but this is believed essential by the Commissioner's Committee on Library Development in achieving total access, the main focus of the system's development. The committee feels that the federal government also has a responsibility to provide its share of incentive aid, and that total access to all types of libraries will eventually require 25 percent funding by the federal government of inter-type library systems.

ED-163 904 Not available NTIS
Nova Univ., Fort Lauderdale, FL.
Implementing a System to Permanently Disseminate Infrequently Used Circulating Media from a District Instructional Materials Center,
Melvin E. Reedy. 19 Jan 78, 56p
Best copy available.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$3.50, MF$0.83 Plus Postage.

Descriptors: Costs, Decentralization, Elementary secondary education, *Filmstrips, Instructional materials centers, Library circulation, Records(Forms), School districts, *School libraries.

A plan was developed and implemented for the removal of 20,877 filmstrips from the central Audiovisual Library of the Dallas Texas Independent School District and their equitable dissemination into individual school media centers within the district. Precipitated by a continuing decline in the annual filmstrip circulation within a six year period, the procedures incorporated in the decentralization plan answered the question of what to do with media that are impractical to circulate from a central library in terms of economics and utilization. The project was financed by an existing budget and carried out by existing personnel. A general outline of the plan is included for use in future considerations of reassigning inappropriately housed media. Appendices contain statistical data on filmstrip circulation and equipment, decentralization expenditures, school media center responses, and several forms utilized during the procedure.

ED-163 910 Not available NTIS
American Library Association, Chicago, IL. Government Documents Round Table.
Analysis of U.S. Government Printing Office Documents Depository Survey Items.
Final rept.,
Tae Moon Lee. 20 Feb 78, 46p
Best copy available.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, MF$0.83 Only, Plus Postage.

Descriptors: Abstracting, Depository libraries, Documentation, Federal government, *Government publications, Information dissemination, Investigations, *Library services, Tables(Data).

The Study Committee on Federal Documents Depository Survey Items analyzed 67 survey items received by each of five selective depository libraries for a two-month period in order to determine the adequacy of annotations on depository survey item cards issued by the Superintendent of Documents of the U.S. Government Printing Office. Findings of the study are discussed, an analysis of survey data is presented, and full compliance with the statutory requirements of Title 44, Unied States Code, section 1904, is urged. An appendix includes a listing of the items surveyed in the study, and a memorandum from J.D. Livsey, Director, Library and Statutory Distribution Service, regarding requirements for new item surveys is included.

PB-298 397/1GA PC **A25**/MF **A01**
Arkansas Rehabilitation Research and Training Center, Hot Springs.
Research Directory of the Rehabilitation Research and Training Centers, Fiscal Years 1976 and 1977.
Nov 77, 585p ISBN-0-931026-00-8
Grant RSA-16-56812
See also report dated 1978, PB-297 303. Library of Congress catalog card no. 77-918-94.

Descriptors: *Research, *Directories, *Rehabilitation, *Education, Abstracts, Indexes(Documentation), Research management, Universities, Industrial training, Medical laboratories, Medical intelligence, Mental deficiency, Auditory defects, Objectives, Methodology.
Identifiers: *Research projects, Deaf research, Medical research, Mental retardation, Training, Vocational rehabilitation, Research and development centers.

The Directory has been prepared for distribution to local, national, and international rehabilitation service agencies and institutions. It represents the coordinated efforts of 19 Rehabilitation Research and Training Centers (12 medical, 3 vocational, 3 mental retardation, and one deafness). The 417 abstracts included in the directory form a spectrum reflecting the continuous sequence of activities involved in the RT Centers' unique synergistic mission. In presenting the individual abstracts in this publication, researchers have supplied project objectives, methodology, and the progress and findings. The name of the principal investigator, status of the research activity, and relevant fiscal data are also included.

PB-298 575/2GA PC **A06**/MF **A01**
Korea Atomic Energy Research Inst., Seoul.
Collected Reprints by Korean Atomic Energy Research Institute Research Papers in 1978. Volume 6.
1978, 109p KAERI/182/RP-6/79
Text in English and Korean.

Descriptors: *Korea, *Scientific research.
Identifiers: *Foreign technology.

The twenty-seven reprints cover research in the area of agriculture, medicine, and biology.

PB-298 717/0GA PC **A12**/MF **A01**
Advisory Group for Aerospace Research and Development, Neuilly-sur-Seine (France).
Como Obtener Informacion en Diferentes Campos de la Ciencia y la Tecnologia: Una Guia para el Usuario (How to Obtain Information in Different Fields of Science and Technology: A User's Guide).
Lecture series.
May 74, 271p AGARD-LS-69
Text in Spanish. See also English version, AD-780 061.

Descriptors: *Information centers, Data processing, Information systems, Documentation, Information retrieval, Methodology, Meetings.
Identifiers: Developing country application.

The purpose of the report is to outline for the user of information systems the principles upon which such systems are based, enabling him to understand and more readily exploit their potentialities. It includes presentations of general information on this subject and more detailed examples of specific scientific, medical and governmental systems.

UCRL-50028-79-1 PC **A04**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
H-Division Quarterly Report, January--March 1979.
1 May 79, 51p
Contract W-7405-ENG-48

Descriptors: *Hydrodynamics, *Lawrence livermore laboratory, *Materials, Research programs, Deformation, Diamonds, Equations of state, Hydrogen, Intermolecular forces, Quartz, Copper, Electric conductivity, Laser-produced plasma, Melting, Shock waves, Very high pressure, Fluids, Liquid metals, Perturbation theory, Plasma, Thermodynamic properties, Blowdown, Bwr type reactors, Cabriolet event, Dynamic loads, Thermonuclear reactor walls.
Identifiers: ERDA/360000, ERDA/640410, ERDA/700200, ERDA/220900.

For abstract, see ERA citation 04:045104.

UCRL-52000-79-3 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Energy and Technology Review.
Mar 79, 29p
Contract W-7405-ENG-48

Descriptors: *Lawrence livermore laboratory, Biological radiation effects, Lasers, Mutagen screening, Research programs, Reviews, Velocimeters.
Identifiers: ERDA/420300, ERDA/560152, ERDA/440300.

For abstract, see ERA citation 04:039293.

5C. Economics

AD-A070 854/5GA PC **A03**/MF **A01**
Institute for Water Resources (Army) Fort Belvoir VA
Impact of Dam and Lake Construction on Rural Economies.
Research rept.,
David Gjesdahl, and William Drake, Jr. Apr 79, 31p Rept no. IWR-RR-79-R4

Descriptors: *Dams, *Economics, *Rural areas, Reservoirs, Construction, Impact, Missouri, Kansas, Land use.
Identifiers: Population growth, Employment, Taxes.

This report is an assessment of the social and economic impact of five dam and lake projects constructed by the Corps of Engineers. Four of the lake projects are located in Kansas, and one in Missouri. Factors used to examine the impact were land use, population, employment, and taxes. The study area includes project counties, or counties containing the dam and all or part of lake; and control counties, or counties which reflect the prevailing social and economic conditions and trends in the rural areas of northeastern and southwestern Missouri. The time frame is focused on three distinct phases of project land acquisition and development.

AD-A071 091/3GA PC **A07**/MF **A01**
Massachusetts Inst of Tech Cambridge Lab for Information and Decision Systems
Sensitivity Analysis of Optimal Linear Random Parameter Systems.
Master's thesis,
Prashant Parikh. May 79, 140p LIDS-TH-911, AFOSR-TR-79-0753
Grants AFOSR-77-3321, NSF-SOC76-05837

Descriptors: *Economic analysis, *Stochastic control, Information processing, Multivariate analysis, Computer programs, Control theory, Feedback, Q factors, Optimization, Dynamic programming, Theses.

This report involves the application of ideas in adaptive stochastic control to economics. We investigate the control problem for a linear, multivariable, dynamic system with purely random (i.e. white) parameters. The quadratic cost criterion is formulated to make the problem a tracking problem. Since the parameters are modelled as white stochastic processes, there is no posterior learning and no dual effect. The certainty-equivalence principle does not hold. We find that the extension of the Uncertainty Threshold Principle from scalar systems to multidimensional ones turns out to be analytically intractable. Next, we derive sensitivity equations for the above optimal system to study the effects of small variations in parameter uncertainties on the optimal performance of the system. These equations enable us to rank parameters in order of the sensitivity of the performance to variations in their variances. This makes it possible to locate the 'pressure' points in a model, if any exist. We then convert an economic policy problem into a stochastic optimal control tracking problem and analyse it with the equations we have derived. We study the different elements that enter into a tracking problem and then discuss the empirical results obtained from the sensitivity equations. The model we choose for the analysis turns out to be insensitive to variations in parameter variances which makes it reasonably reliable. We also analyse in detail the structure of the model and the interdependences of the state and control variables.

COO-4546-11 PC **A02**/MF **A01**
Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
Problems Encountered by Lending Institutions and Appraisers with Respect to Solar-Equipped Buildings. Final Report of Innovative Research Program Subtask, December 1977–September 1978.
G. J. Kress. Oct 78, 21p
Contract EG-77-S-02-4546

Descriptors: *Solar cooling systems, *Solar heating systems, Colorado, Evaluation, Financing, Public opinion, Residential buildings.
Identifiers: ERDA/140400, ERDA/140300, ERDA/299001.

For abstract, see ERA citation 04:040510.

FIPS PUB 66 PC **A03**/MF **A01**
National Bureau of Standards, Washington, DC.
Standard Industrial Classification (SIC) Codes. Federal General Data Standard Representations and Codes.
Federal information processing standards,
Hazel E. McEwen. 15 Aug 79, 28p*
Three ring vinyl binder also available, North American Continent price $6.25; all others write for quote.

Descriptors: *Industries, *Classifications, Coding, Standards.
Identifiers: Standard industrial classification codes, SIC numbers, Federal Information Processing Standards.

This standard provides classifications, short titles, and codes for representing industries. The general concept of an industry is one of a group of establishments with similar economic activities. The SIC codes, initially developed by the Office of Management and Budget, are currently being maintained and published by the DOC Office of Federal Statistical Policy and Standards, the organization to which this function has been transferred. This standard is prescribed for the interchange of data among agencies and between agencies and the public including industry and State and local governments. Use within agency data systems is encouraged when such use contributes to operational benefits, efficiency, or economy.

HRP-0027941/4GA Not Available NTIS
South Carolina Univ., Columbia. Coll. of Business Administration.
Hospital Cost Inflation and Health Insurance -- A Complex Market Model.
Philip Jacobs, Alan D. Bauerschmidt, and Richard W. Furst. 1978, 8p
Pub. in Inquiry, v15, n3, p217-224, Sep 78.

Descriptors: Acute care, Economics, Financing, *Health care costs, Health care delivery, Health care, Health economics, Health insurance, Health occupations, Health resources, Inpatient care, Patients, Physicians, *Prepaid health care.

A discussion of hospital cost inflation and the growth in third party financing is presented. The growth in third party financing is considered to be the key factor in influencing increasing hospital costs. A description of economic phenomena in the hospital care market is provided and a brief summary is supplied of the traditional market explanation of these events. It is pointed out that when hospital insurance is acquired, the direct price of hospitalization is lowered. Thus, the quantity of hospital care demanded is increased. The role of consumers in the hospital care market is considered. It is noted that when hospital costs increase, the potential gain from insurance grows. Insured consumers increase their coverage and uninsured consumers make the decision to buy insurance. This phenomenon is said to contribute to the inflationary mechanism. A discussion of the physician's relationship with the consumer-patient is presented, and it is pointed out that physicians are more likely to hospitalize insured patients than uninsured ones. The primary factor which kept hospital costs from rising further is said to have been the regulation of insurance companies. In all States, insurance companies have been willing to contain premium increases. The insurance companies have passed these constraints on to the hospitals in the form of tighter controls on payments.

HRP-0029394/4GA Not Available NTIS
Memphis State Univ., TN.
Marketing and Preventive Health Care -- Interdisciplinary and Interorganizational Perspectives.
Philip D. Cooper, William J. Kehoe, and Patrick E. Murphy. 1978, 132p
Available from American Marketing Association, 222 S. Riverside Plaza, Chicago, IL 60606.

Descriptors: Ailments, Economics, Health care technology, Health care, *Health economics, Methodology, *Preventive medicine.

The material in this book is drawn from a multidisciplinary workshop on marketing and preventive health care. The introductory essay reflects on the future development of preventive health care and marketing. The papers that follow deal with the environment for marketing of preventive health care, viewpoints on various aspects of marketing in the health care area, special topics (e.g., the role of consumer research in guiding preventive health policies, the place of advertising in preventive health care, the use of incentives to affect preventive health care service utilization and the acceptability of marketing in the preventive health care area). The problems and limitations of preventive health care and marketing from the viewpoint of Government, from the academic viewpoint, and from the practitioner's viewpoint are considered, and issues, opportunities, and future research areas for preventive health care marketing are discussed.

LA-6995-MS(Rev.) PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Los Alamos Scientific Laboratory Building Cost Index.
C. Leach. Apr 79, 14p
Contract W-7405-ENG-36

Descriptors: *Building materials, *Buildings, Computer calculations, Construction, Cost, Economics, Graphs, Inflation, Labor, LASL, Programming.
Identifiers: ERDA/320100, ERDA/290200, Cost estimates.

For abstract, see ERA citation 04:043264.

PB-298 909/3GA PC **A07**/MF **A01**
Mississippi Tourism Study Commission, Jackson.
Report and Recommendations of the Tourism Study Commission to the Legislature of Mississippi.
Feb 78, 137p

Descriptors: Travel, Industries, Employment, Income, Promoting, Parks, Recreational facilities, State government, Mississippi.
Identifiers: *Tourism, Tourism Study Commission.

Contents:
- The relative value of travel and tourism to Mississippi;
- Review of factors related to the development and promotion of tourism in Mississippi;
- Summary of the report and recommendations of the Tourism Study Commission;
- Appendix I --Summaries of presentations before the Tourism Study Commission;
- and Appendix II-- A listing by congressional districts of selected public facilities related to tourism.

PB-299 004/2GA PC **A04**/MF **A01**
Coeur d'Alene Tribal Council, Plummer, ID.
Coeur d'Alene Resource Development Project, Coeur d'Alene Tribe, Plummer, Idaho, Annual Progress Report.
Final rept. Jul 77-May 78.
Jul 79, 68p EDA-79-0133
Grant EDA-07-6-01448-2
See also report dated Sep 77, PB-274 714.

Descriptors: *Economic development, *Technical assistance, American Indians, Businesses, Farms, Forestry, Employment, Recreation, Community development, Natural resources, Idaho.
Identifiers: Coeur d'Alene Indian Reservation, Tourism, Coeur d'Alene(Idaho).

The study is about the Coeur d'Alene Tribe of Idaho and their objective to establish a tribal economy based on the natural resources of the reservation. One of the major goals is to implement a plan for the development and promotion of tourism and recreation of the Reservation. This can be done by conducting feasibility studies and outlining the identifying areas to be used. With the development of forest resources and expansion of the Tribal Farm, sound economic development can help the Tribe develop full potential of their forest resources.

PB-299 033/1GA MF **A01**
Department of Commerce, Washington, DC.
Business America - The Journal of Industry and Trade. Volume II, Number 18, August 27, 1979.
Bi-weekly pub.
27 Aug 79, 49p
See also Volume 2, Number 17, PB-298 480.
Paper copy available from Supt. of Docs.

Descriptors: *Commerce, *Periodicals, Patents, Protection, International trade, Legislation, China.

Contents:
- Foreign patent protection for exporters;
- Congress considers major trade legislation;
- Joint venture law marks new China policy;
- Economic highlights;
- Domestic business report;
- Business outlook abroad;
- Worldwide business opportunities.

PB-299 245/1GA PC **A03**/MF **A01**
South Carolina Wildlife and Marine Resources Dept., Charleston. Marine Resources Center.
An Economic Analysis of Mobility of Shrimp Vessels in the South Atlantic States,
David S. Liao. May 79, 42p TR-35, NOAA-79072502
Grant NOAA-03-7-042-35102

Descriptors: *Economic analysis, *Shrimps, *Fishing, Merchant ships, Boats, Mobility, Social effect, Economic impact, Coasts, Regulations, Licenses, Productivity, Income, Profits, Variable costs.
Identifiers: Southeastern Region(United States).

The purpose of this study was to develop economic information concerning mobility of shrimp trawlers in the South Atlantic states. The study examined the mobility patterns of trawlers, factors associated with the trawler mobility, and the economic performance of various types of shrimping operations. The specific objectives of the study were to (1) determine the pattern and extent of vessel mobility, (2) develop socio-economic orofiles of vessels and captains, (3) identify some factors that affect vessel mobilities, (4) compare the productivity and profitability of vessel mobility classes, and (5) evaluate impacts of management options on vessel mobility. Data for the study have come from personal interviews with sample shrimpers and secondary data such as state statutes and fishing regulations in the region.

5D. History, Law, and Political Science

AD-A071 013/7GA PC **A02**/MF **A01**
Army Command and General Staff Coll Fort Leavenworth KS
Spain and the Defense of Europe: A Geopolitical Perspective.
Final rept.,
Leandro Penas. 8 Jun 79, 15p
Master's thesis.

Descriptors: *Spain, *Geopolitics, Theory, Geography, History, Theses.

This study attempts to establish the strategic importance and value of Spain in relation to the defense of Europe. The research has been done through four different approaches consisting of analyzing successively: the position of Spain in the light of the main geopolitical theories, the geographic features of the country, the most significant events of the Spanish history, and the possible role to be played by Spain in the current political confrontation between the East and the West.

AD-A071 080/6GA PC **A08**/MF **A01**
Naval Postgraduate School Monterey CA
Namibia 1979: Another Angola
Master's Thesis,
David Malcolm Stone. Mar 79, 169p

Descriptors: *South Africa, Political alliances, Government(Foreign), ANGOLA, USSR, International politics, International relations, Intervention, Theses.
Identifiers: Namibia.

The struggle for majority rule in southern Africa is today a subject of great concern. It is truly an area of Great Power involvement as evidenced by the recent events in Angola and Mozambique. The transition of Namibia from a territory illegally occupied by South Africa to an independent nation is a critical issue. The question of whether its independence will come through a peaceful UN sponsored plan or through the 'armed struggle' of the liberation group SWAPO is yet to be determined. This thesis examines the complex factors involved in Namibia's transition process. The roles of the various actors are described and the similarities to the Angola crisis of 1975 analyzed. Particular attention is paid to recent Soviet/Cuban activities in the region. Finally, the possible scenarios for Namibia's transition process are developed and the role of the U.S. in this critical area scrutinized. (Author)

DOE-tr-163 PC **A02**/MF **A01**
Answer of the Federal Government on Pamphlet 8/2041: Cooperation in the Areas of Research and Technology with Countries of the Third World.
1 Aug 78, 12p
C Pamphlet 8/2074.

Descriptors: *Developing countries, *German Federal Republic, Government policies, International cooperation, Research programs, Technology transfer.

Identifiers: ERDA/290500, Translations, West Germany.

For abstract, see ERA citation 04:041040.

N79-28399/0GA PC **A02**/MF **A01**
Fondazione Ugo Bordoni, Rome (Italy).
Considerazioni Generali Sul Problema Del Riconoscimento Del Parlatore a Scopi Legali (General Considerations About Speaker Recognition for Legal Use).
I. Barducci, G. Ibba, and A. Paoloni. Aug 78, 25p FUB-19-1978
Language in Italian.

Descriptors: *Law (Jurisprudence), *Speech recognition, *Voice, *Voice data processing, Audio frequencies, Frequency ranges, Harmonics, Spectrum analysis, Tape recorders, Telephony.

For abstract, see STAR 1719

PB-298 135/5GA PC **A05**/MF **A01**
Enviro Control, Inc., Rockville, MD.
Instream Flow Strategies for Colorado,
Wayne Nelson, Gerry Horak, and Martin Lewis. May 78, 98p FWS/OBS-78/37
Contract DI-14-16-0008-2121
See also report dated Oct 77, PB-276 046.

Descriptors: *Stream flow, *Wildlife, *Fishes, *Water law, Colorado, Regulations, Water flow, Civil engineering, Water storage, Project planning, Reservoirs, Water storage, National government, Government policies, Financing, Water resources, Decision making, Evaluation, State government.
Identifiers: *Low flow, *Institutional framework, Western Region(United States), Water management(Applied), Wild rivers.

This is one of 13 reports that identifies and evaluates the most promising institutional methods for reserving instream flows to benefit fish and wildlife in each of 13 western states. The states included in the study are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington and Wyoming. Each report has three main sections. First is a guide to help the reader select the most important strategy for any given situation, followed by a summary evaluation of how well the method has worked in the state. The third part is a detailed narrative description of the procedures for implementing the strategy and an example of how it has been employed in the state.

PB-298 146/2GA PC **A06**/MF **A01**
Enviro Control, Inc., Rockville, MD.
Instream Flow Strategies for Idaho,
Wayne Nelson, Gerry Horak, and Joe Solomon. May 78, 106p FWS/OBS-78/38
Contract DI-14-16-0008-2121
See also report dated Oct 77, PB-276 046.

Descriptors: *Stream flow, *Wildlife, *Fishes, *Water law, Idaho, Regulations, Water flow, Decision making, State government, Government policies, Evaluation.
Identifiers: *Low flow, Western Region(United States), *Institutional framework, Water management(Applied).

This is one of 13 reports that identifies and evaluates the most promising institutional methods for reserving instream flows to benefit fish and wildlife in each of 13 western states. The states included in the study are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming. Each report has three main sections. First is a guide to help the reader select the most important strategy for any given situation, followed by a summary evaluation of how well the method has worked in the state. The third part is a detailed narrative description of the procedures for implementing the strategy and an example of how it has been employed in the state.

PB-298 790/7GA PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Financial and General Management Studies Div.
Financial and Legal Implications of Iran's Cancellation of Arms Purchase Agreement.
Report to the Congress.
25 Jul 79, 31p FGMSD-79-47

Descriptors: *Iran, *Agreements, Purchasing, Foreign government, Exports, Control, United States Government, Financial management, Accounting.
Identifiers: *Foreign military sales.

Earlier this year, the Iranian government cancelled and/or the Defense Department reduced about $10.6 billion of Iran's $12.6 billion in undelivered foreign military sales orders. Senators Max Baucus and Donald W. Riegle, Jr. questioned GAO about the effects of Iran's actions. In summary, GAO said that one way to protect the financial interests of the United States, would be for the Congress to amend the Arms Export Control Act to require purchasers to deposit, in advance, enough funds to cover potential costs of a cancelled contract. Until the Congress considers legislative changes, the Department of Defense should take the initiative to collect potential termination costs on all foreign military sales. To solve continuing accounting and financial management problems, the Congress and the Secretary of Defense should adopt earlier GAO recommendations to centralize accounting and financial management for the foreign military sales program.

PB-298 791/5GA PC **A09**/MF **A01**
Conservation Foundation, Washington, DC.
Federal Resource Lands and Their Neighbors.
1979, 179p NSF/RA-790084
Grant NSF-DAR77-13904

Descriptors: *Public land, *Management, Land use, Government policies, Conflict, Objectives, National parks, Forest land, Wildlife, Natural resources.
Identifiers: National Park System, Forest service, Fish and Wildlife Service, Bureau of Land Management, Wildlife refuges.

This report is aimed at identifying problems and conflicts that exist between federal lands and their neighbors, at clarifying issues, at providing information on the origins, scale, and significance of these conflicts, and at possible approaches to their resolution and prevention. The neighbors with which it is concerned are federal land-management agencies, state and local governments, and private landowners. The lands are those managed by the four principal federal land-management agencies, the National Park System (National Park Service), the national forests (U.S. Forest Service), the national wildlife refuges (U.S. Fish and Wildlife Service), and national resource lands (Bureau of Land Management). Variations exist in purpose and management objectives, and in environmental, economic, and social settings among these lands, but their characteristics and purposes are not so dissimilar that they cannot be considered together. Units of the different agencies experience many common problems related to adjacent lands and the experience of one agency in developing a successful strategy for resolution may provide a lesson for others. Opportunities for resolution of conflict are affected by the perceptions that neighbors have of the federal unit, particularly local expectations and aspirations about the potential for economic benefit from management of the federal land. Nonfederal perspectives toward the federal units are examined in detail.

5E. Human Factors Engineering

AD-A070 548/3GA PC **A03**/MF **A01**
Oregon Univ Eugene Dept of Psychology
Is Time-Sharing a General Ability.
Technical rept.,
Harold L. Hawkins, Elizabeth Rodriguez, and Gerald M. Reicher. 30 Jun 79, 35p Rept no. TR-3
Contract N00014-77-C-0643

Descriptors: *Time sharing, *Human factors engineering, Information processing, Performance(Human), Students, Tables(Data).

The time-sharing ability of 18 students was measured under 8 separate dual-task (double-stimulation) conditions. Three task characteristics -- input modality (auditory or visual), output modality (vocal or manual) and task difficulty (easy or difficult) -- were systematically varied across conditions in an effort to manipulate the nature of the specific time-sharing demands imposed. Each condition contained two of these characteristics in common with 3 of the remaining 7 conditions, one of the characteristics in common with 3 others, and none in common with the last condition. Time-sharing efficiency was found to correlate across conditions that impose similar processing demands on the individual, but not across conditions imposing relatively dissimilar demands. We conclude on this basis that time-sharing performance is largely determined by several poorly corelated, task-specific subcapacities rather than by a single general capacity or ability. (Author)

AD-A070 632/5GA PC **A08**/MF **A01**
Bolt Beranek and Newman Inc Cambridge MA
A Performance Analyzer for Identifying Changes in Human Operator Tracking Strategies.
Final rept. 11 Jul 77-13 Oct 78,
Greg L. Zacharias, and William H. Levison. Mar 79, 170p BBN-3910, AMRL-TR-79-17
Contract F33615-77-C-0522

Descriptors: *Tracking, Performance(Human), Operators(Personnel), Man machine systems, Models, Control, Performance tests, *Human factors engineering.

An experimental and analytical study was undertaken by Bolt Beranek and Newman Inc. to develop, implement, and validate a compensatory tracking task for use as a preliminary screening task in the assessment of visual countermeasures. The optimal control model of the human operator was used to design the tracking task consisting of an unstable controlled element perturbed by a sum-of-sines disturbance function. A minicomputer-based system was developed to implement the task, and the resulting Performance Analyzer was used to conduct the experimental validation phase of the study. Two simulated stressors were introduced into the tracking task, and the results showed that significant differences could be detected between tracking conditions, thus validating the task's sensitivity to imposed stress. A comparison of the data trends with pre-experimental model predictions served to identify the particular stressor effects, and thus provided a means of differentiating between stressors. A follow-up quantitative model analysis provided an efficient means of compressing the tracking data made available by the Performance Analyzer, and also provided a verification of the task's utility in isolating and identifying stressor effects. (Author)

AD-A071 113/5GA PC **A08**/MF **A01**
Science Applications Inc Englewood CO
Annotated Bibliography on Human Factors in Software Development.
Special rept. 11 Nov 77-12 Jul 78,
Michael E. Atwood, H. Rudy Ramsey, Jean N. Hooper, and Daniel A. Kullas. Jun 79, 172p SAI-79-102-DEN , ARI-TR-P-79-1
Contract DAHC19-76-C-0040

Descriptors: Bibliographies, *Human factors engineering, Computer programming, Debugging(Computers), Literature surveys, Programming languages, Computer program reliability, Computer program verification.
Identifiers: *Software engineering.

As part of a larger Army Research Institute effort to survey, synthesize, and evaluate the state of the art in the area of human factors as applied to software development, a fairly extensive literature survey was conducted. This resulting bibliography contains citations of 478 articles or reports petaining to the behavioral aspects fo software design, programming, coding, debugging, testing, evaluation, and maintenance. Most citations are accompanied by descriptive abstracts, and all are indexed by author, publication source, institutional affiliation, and subject. To help the user unfamiliar with the area, the bibliography contains brief, basic reference lists in the areas of software engineering, the psychology of software development, the Structured Programming Series, and the DoD software program. Coverage is exhaustive through 1977 with a few references in 1978. (Author)

AD-A071 196/0GA PC **A09**/MF **A01**
Perceptronics Inc Woodland Hills CA
Guide for Obtaining and Analyzing Human Performance Data in a Materiel Development Project.
Technical memo.,

Barry L. Berson, and William H. Crooks. Sep 76, 183p PTR-1026-3-10/76, HEL-TM-29-76
Contract DAAD05-76-C-0734

Descriptors: *Performance tests, *Human factors engineering, Research management, Experimental design, Experimental data, Reliability, Specifications, Systems analysis, Data acquisition, Reports, Systems management, Man machine systems, Test and evaluation.
Identifiers: Test management.

This report contains guidelines for conducting, analyzing, and reporting HFE tests according to the specifications of DI-H-1334A (recently republished as DI-H-7058). This report was developed for contractor HFE personnel, contract monitors, and program managers. Chapter 2 presents guidelines for HFE personnel on how to conduct HFE tests according to DI-H-1334A requirements. Chapters 3 and 4 are detailed examples of HFE test reports of systems in the Experimental Prototype and Advanced Development Prototype stages of development, respectively. These sample test reports illustrate the contents and level of detail required in DI-H-1334A test reports. Chapter 5 describes how the data collected in HFE tests can be used to increase overall system reliability and effectiveness, when to perform the HFE tests during materiel system development, and how to minimize problems that can occur in HFE tests.

5F. Humanities

PB-298 527/3GA PC **A06**/MF **A01**
Vanderbilt Univ., Nashville, TN. Dept. of Sociology and Anthropology.
A Cultural Resource Reconnaissance of the Cross Creeks National Wildlife Refuge with Archaeological Survey of Selected Areas, Stewart County, Tennessee. Volume 1.
Research repts. in anthropology (Final) Mar-Jul 78,
William O. Autry, Jr., and Jane S. Hinshaw. Jul 78, 109p VURRA-1
Sponsored in part by Heritage, Conservation and Recreation Service, Atlanta, GA. Interagency Archeological Services, and Fish and Wildlife Service, Atlanta, GA. Region 4.

Descriptors: *Archaeology, Site surveys, Investigations, Excavation, Tennessee.
Identifiers: *Cross Creeks National Wildlife Refuge, *Wildlife refuges, Stewart County(Tennessee).

Archaeological and historical investigations of the Cross Creeks National Wildlife Refuge in Stewart County, Tennessee, recorded nine prehistoric sites and two historic localities. This cultural resource reconnaissance with archaeological survey of selected areas included (1) an inventory of resources of the refuge area, (2) a literature and background search for the Lower Tennessee-Cumberland region, (3) an evaluation and investigation of the impact of proposed improvements upon cultural resources, and (4) a series of recommendations for project planners and future archaeological investigators. The refuge is placed in the larger framework of the culture history of the Lower Tennessee-Cumberland region.

PB-298 558/8GA PC **A04**/MF **A01**
California Univ., Santa Barbara. Social Process Research Inst.
Data Recovery Program to Mitigate the Effects of the Construction of Space Transportation System Facilities on Seven Archaeological Sites on Vandenberg Air Force Base, Santa Barbara County, California,
Michael A. Glassow. 25 Jan 79, 56p
Contract HCRS-C25522
Errata sheet inserted.

Descriptors: *Archaeology, Site surveys, Radiocarbon dating, Excavation, Anthropology, Construction, Military facilities, California.
Identifiers: *Vandenberg Air Force Base, Santa Barbara County(California), Space Transportation System project.

A plan is proposed for the recovery of data from three prehistoric habitation sites, 4-SBa-539, 670, and 931, which will be adversely affected by the Space Transportation System Project, Vandenberg Air Force Base, California. Phase II testing suggests that SBa-539 and 670, fall within the Late Period, AD 1000 to European contact, with a possible Middle-Period component at 670, while SBa-931, radiocarbon-dated to BC 6000, represents the Early Period, or Millingstone Horizon, of Southern California prehistory. Excavation will utilize conventional fine scale techniques and specialized sample collection. Data analysis will provide information on prehistoric subsistence and settlement patterns, inter-regional trade, and functions of distinctive artifact types. Cultural change will be identified and comparisons made between cultural developments of Vandenberg and neighboring regions.

PB-298 687/5GA PC **A05**/MF **A01**
Arizona State Museum, Tucson. Cultural Resource Management Section.
The Relationship of Casa Grande Ruin to Compound A: Research Potential of the in situ Deposits.
Final rept.,
David R. Wilcox. Nov 75, 78p
ARCHAEOLOGICAL SER-83, NPS/WAC-79/10
Contract NPS-PX-8100-5-0200

Descriptors: *Archaeology, Site surveys, Excavation, Anthropology, Stratigraphy, National parks, Arizona.
Identifiers: Casa Grande National Monument, Pinal County(Arizona).

In May and June of 1975, the National Park Service funded archeological fieldwork designed to study the relation of Casa Grande to Compound A in Casa Grande National Monument. Two earlier excavations on the south and east sides of Casa Grande in 1969 were re-opened and detailed profiles were drawn of all exposed deposits. This report is an in-depth analysis of those profiles together with a systematic review of the literature on the relationships of Casa Grande to Compound A. In addition, the significance of archeological resources discovered still in situ contiguous to Casa Grande is discussed and the importance of their research potential is emphasized. Finally, recommendations are made as to what steps must be taken to ensure preservation or proper mitigation of the archeological deposits in and around Casa Grande.

PB-298 692/5GA PC **A06**/MF **A01**
California Univ., Santa Cruz. Dept. of Anthropology.
Archeological Overview of Pinnacles National Monument, San Benito County, California.
Final rept.,
John M. Fritz, and Charles Smith. Dec 78, 110p NPS/WAC-79/09
Contract NPS-PX-8100-5-0323
Prepared in cooperation with California State Univ., Hayward. Dept. of Anthropology.

Descriptors: *Archaeology, Site surveys, Investigations, Ethnology, Anthropology, National parks, California.
Identifiers: Pinnacles National Monument, San Benito County(California).

The report is an overview of the known prehistoric archeological resources of the Pinnacles National Monument together with suggestions for the future management of these resources. The environmental setting of the Monument is discussed in terms of the biotic elements of its ecosystems, the elements utilized by Native American populations, and changes which have resulted from aboriginal and post-aboriginal use. Next, the known prehistory and history of the central coastal region of California is outlined from three different perspectives--the chronological, the functional and the processual. An ethnographic reconstruction of the adaptations of Costanoan-speaking peoples at the time of Spanish contact follows, providing possible insights into prehistoric lifeways in the Pinnacles area. Past archeological research in the central California coastal zone and in the Monument proper is summarized and used as a basis for identifying potential research questions for future work. Finally, recommendations for the management of these resources are made.

PB-298 855/8GA PC **A12**/MF **A01**
California Univ., Santa Barbara. Dept. of Anthropology.
An Archaeological Overview of the Northern Channel Islands, California, including Santa Barbara Island,
Michael A. Glassow. Jan 77, 258p NPS/WAC-79/12

Descriptors: *Archaeology, San Miguel Island, Santa Rosa Island, Santa Cruz Island, Anacapa Island, Santa Barbara Island, Ethnology, Anthropology, Land use, National parks, California.
Identifiers: Channel Islands National Monument.

The subject of this overview concerns the archeological resources of the northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz and Anacapa Islands) and Santa Barbara Island, all of which lie off the Southern California coast. The cultural resources of Santa Barbara, Anacapa and San Miguel Islands are under National Park Service administration as the Channel Islands National Monument. This overview was prepared in order to provide background information necessary for effective management. The basic objectives of the overview are threefold: (1) To summarize the past archeological work and the extent of knowledge of the prehistory of the islands, (2) To determine the scientific value of the archeological resources on the islands, and (3) To provide recommendations for the management of the archeological resources. These objectives are met first with a discussion of the islands regional context and ethnographic background with an eye towards regional research problems. Following this, the overview focuses on one island at a time, presenting an environmental description, history of land use, summary and evaluation of previous archeological projects, and an assessment of the condition and research potential of the archeological resources.

5G. Linguistics

AD-A070 618/4GA PC **A07**/MF **A01**
National Security Agency/Central Security Service Fort George G Meade MD
The Voynich Manuscript: An Elegant Enigma,
Mary E. D'Imperio. 1978, 141p

Descriptors: *Decoding, *Linguistics, Symbols, History, Philosophy.
Identifiers: Paleography, Voynich manuscript.

In spite of all the papers that others have written about the manuscript, there is no complete survey of all the approaches, ideas, background information and analytic studies that have accumulated over the nearly fifty-five years since the manuscript was discovered by Wilfrid M. Voynich in 1912. This report pulls together all the information the author could obtain from all the sources she has examined, and to present it in an orderly fashion. The resulting survey will provide a firm basis upon which other students may build their work, whether they seek to decipher the text or simply to learn more about the problem.

ED-163 912 Not available NTIS
RAND Corp., Santa Monica, CA.
Knowledge Acquisition from Structural Descriptions,
Frederick Hayes-Roth, and John McDermott. Nov 76, 67p P-5910
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$3.50, MF$0.83 Plus Postage. Also available from Publications Department, The RAND Corp., 1700 Main Street, Santa Monica, CA. 90406 ($5.00).

Descriptors: *Algorithms, Cognitive processes, Complexity level, Componential analysis, *Computational linguistics, Computer science, Concept formation, Inductive methods, Models, Self pacing machines, Task analysis.

The learning machine described in this paper acquires concepts representable as conjunctive forms of the predicate calculus and behaviors representable as productions (antecedent-consequent pairs of such conjunctive forms): these concepts and behavior rules are inferred from sequentially presented pairs of examples by an algorithm that is probably effective for a wide variety of problems. A method for inducing knowledge by abstracting such representations from a sequence of training examples is described. The proposed

learning method, interference matching, induces abstractions by finding regional properties common to two or more exemplars. Three tasks solved by a program that performs an interference matching algorithm are presented. Several problems concerning the relational representation of examples and the induction of knowledge by interference matching are also discussed. The similarities between this task and other computer science problems are indicated, and directions for future research are considered.

5H. Man-Machine Relations

AD-A070 705/9GA PC **A02**/MF **A01**
Applied Psychological Services Inc Wayne PA Science Center
Decision Aid Evaluation Program.
Annual rept. Jul 78-Jun 79,
Arthur I. Siegel, and Edward G. Madden. Jun 79, 15p
Contract N00014-77-C-0448

Descriptors: *Man computer interface, *Decision making, Naval operations, Problem solving, Computer applications, Military commanders, Strike warfare.

The progress over a one year period on a program to evaluate various Navy operation oriented decision aids is summarized. The work over the period included (1) evaluation perspective development, (2) laboratory coordination, (3) evaluation method development for a strike timing aid and implementation of the evaluation design, (4) report preparation, and (5) initial steps toward the evaluation of a second operational decision aid. The work in each of these areas is summarized. (Author)

AD-A070 706/7GA PC **A05**/MF **A01**
Systems Research Labs Inc Dayton OH
Studies in Tactical Symbology. I. Preferred Tactical Symbology for Joint Tactical Information Distribution System (JTIDS).
Technical rept.,
William H. Pearson, Michael F. Rundle, and Mark S. Hoffman. Feb 79, 77p AMRL-TR-78-115
Contract F33615-75-C-0127
See also Rept. no. ASD-TR-77-31-PT-1, AD-A058 207 and Rept. no. ASD-TR-77-31-PT-2, AD-C016 612.

Descriptors: *Symbols, *Display systems, *Tactical data systems, Tactical aircraft, Pilots, Students, Statistical analysis.
Identifiers: Joint Tactical Information Distribution system, Preferences, F-111D aircraft, F-15 aircraft.

This report describes one of a series of studies attempting to design an optimal symbol set to use in tactical order-of-battle display for single seat aircraft. Air Force tactical pilots flying F-111D's and F-15's were interviewed to ascertain their preferences for symbols to represent 42 tactical objects or events. Modal or typical symbol constructions for each object/event for both types of pilots were selected, tabled, and compared with choices of naive college students and a panel of Air Force professional human factors personnel. Conclusions were: (1) symbols should be as realistic or pictorial as possible, (2) existing standard symbols should be used, and (3) the symbol set should be standardized at the highest Air Force administration level practicable. Pilot-in-the-loop mission based simulations are to be developed in which tactical display symbology will be evaluated based on the findings of this study.

AD-A070 989/9GA PC **A03**/MF **A01**
New Mexico State Univ Las Cruces Human Performance Lab
Discriminability of Symbols for Tactical Information Displays.
Technical rept.,
Evelyn Williams, and Warren H. Teichner. Jan 79, 42p NMSU-AFOSR-TR-79-1, AFOSR-TR-79-0766
Contract F44620-76-C-0013

Descriptors: *Tactical data systems, *Display systems, Performance(Human), Discrimination, Symbols, Target discrimination, Visual aids, Standard deviation, Decision making, Response, Reaction time.

The relative discriminability of 210 stimulus items was determined by a comparison of response time and errors in a search task in which the operator identified symbols as examples or non-examples of a prespecified target item. The characteristics of the target item relative to non-target items determined the response times to target and non-target items and the variability among non-target response times. Non-targets which were highly confusable with the target tended to increase response time and variance. Symbols were ranked according to target and non-target response times. (Author)

5I. Personnel Selection, Training, and Evaluation

AD-A070 555/8GA PC **A03**/MF **A01**
California Military Dept Sacramento Office of Policy and Legislative Liaison
The United States Army's Total Force Program.
Final rept.,
Herbert P. Holeman, James R. Yeo, and Jesse J. Orta. 1 Jul 77, 42p

Descriptors: *Army, *Military reserves, National Guard, Mobilization, Army training, Civic action.
Identifiers: *Total Force Concept.

Study evaluates the Total Force programmatic concept as applied to Reserve Components of the United States Army and suggests ways in which improvements can be made. Study format consists of two sections. The first section defines the Total Force Concept in terms of planning and implementation. The second section presents recommendations for ways of overcoming shortfalls in planning and implementation of the Total Force Program. (Author)

AD-A070 583/0GA Not available NTIS
Human Resources Research Organization Alexandria VA
System Concept in Education.
Professional paper,
Robert G. Smith, Jr. 1974, 14p Rept no. HUMRRO-PP-20-74
Availability: Pub. in The Encyclopedia of Education, v8 p583-587 Nov 74. (No copies furnished by DDC).

Descriptors: *Education, Systems analysis, Schools, Information systems, Training, Computerized simulation, Performance tests, Quality control, Students, Reprints.

No abstract available.

AD-A070 622/6GA PC **A04**/MF **A01**
Human Resources Research Organization Alexandria VA
Comparing Military and Civilian Skill Training: Instruction and Program Evaluation.
Final rept. 1 Oct-31 Dec 76,
Burl B. Gray, John E. Taylor, and Wendy J. McGuire. Dec 76, 64p Rept no. HUMRRO-FR-WD-CA-76-20
Contract MDA903-77-C-0028

Descriptors: *Job training, Military training, Civilian personnel, Schools, Comparison, Department of Defense, Productivity, Skills, Management, Questionnaires, Cost analysis, Job analysis.

The work reported here was accomplished during the last quarter of 1976. A questionnaire study was conducted to gather in-depth comparative data on job training practices in DOD, commercial business/institutions/industries (B/I/I), and proprietary trade/technical schools (T/TS). Detailed questionnaires requesting information on the management, conduct, and costs of 12 high-priority job training courses having military and civilian counterparts, were sent to the training managers/directors of 33 T/TS, 29 B/I/I, and 20 DOD schools.

AD-A070 639/0GA PC **A06**/MF **A01**
Air Force Occupational Measurement Center Randolph AFB TX
Airfield Management, Operations System Management, and Command and Control Career Ladders AFSCs 27131, 27151, 27171, 27132, 27152, 27172, 27199, 27430, 27450, 27470, and 27490.
Occupational survey rept.
May 79, 123p

Descriptors: *Job analysis, Careers, Aviation personnel, Specialists, Job training, Tables(Data), Surveys, Job satisfaction, *Air Force personnel.
Identifiers: Airfield management, Operations system management, Command and control personnel, Career ladders.

This is a report of an occupational survey of personnel in the Airfield Management, Operations System Management, and Command and Control career ladders which was completed by the Occupational Survey Branch, USAF Occupational Measurements Center during May 1979. This survey was requested by HQ USAF/XOOO and HQ ATC/TTQ in order to provide an updated data base from which job information could taken to make decisions regarding management and training of these personnel resources.

AD-A070 640/8GA PC **A07**/MF **A01**
Air Force Occupational Measurement Center Randolph AFB TX
Operating Room, Ophthalmology Surgical, Otorhino-Laryngology Surgical, Urology Surgical, Orthopaedic Clinic, and Optometry Career Ladders AFSCs 90232, 90252, 90272, 90292; 91230, 91270; 91231, 91271; 91232, 91272; 91233, 91273; 91235, 91255, 91275, and 91295.
Occupational survey rept.
Apr 79, 139p

Descriptors: *Job analysis, *Medical personnel, Specialists, Job satisfaction, Ophthalmologists, Otorhinolaryngology, Optometry, Careers, Personnel management, Surveys, Air Force personnel.

This is a report of an occupational survey of personnel in the Operating Room)902X2), Ophthalmology Surgical (912X0), Otorhinolaryngology Surgical (912X1), Urology Surgical (912X2), Orthopaedic Clinic (912X3), and Optometry (912X5) career ladders, completed by the Occupational Survey Branch, USAF Occupational Measurement Center, during April 1979. This report is one of three prepared for the Classification Branch of the Air Force Manpoweer and Personnel Center (AFMPC/MPCRPQ) in response to their request for occupational data concerning selected AFSCs within the Medical career field 'to determine if the current classification structure is adequate.'

AD-A070 722/4GA PC **A07**/MF **A01**
Human Resources Research Organization Alexandria VA
Reenlistment Evaluation: A Study of the Army Reenlistment System and an Evaluation of Current and New Reenlistment Standards.
Final rept. 14 Jul-14 Sep 76,
Richard J. Orend, Christine Bernardeau, Theodore Rosen, and Myron A. Rimm. Sep 76, 130p Rept no. HUMRRO-FR-ED-76-32
Contract DAHC19-76-C-0004

Descriptors: *Reenlistment, Standards, *Army, Quality control, Recruits, Skills, Manpower utilization, Systems analysis, Personnel management.

The objectives of the study were to examine the current reenlistment process, evaluate the post-reenlistment predictive validity of current reenlistment and several new reenlistment standards, and determine the impact of any new standards on the selection of subsequent reenlistees. The study was restricted to the use of data already available on the EMTR or in personnel files. Results showed new standards as somewhat better predictors of post-reenlistment PMOS scores than current standards for both first-term and career reenlistees. However, the amount of explained variance was not large (due, at least partially, to severe data problems and pre-selection of subjects from among only those who had already been allowed to reenlist) and prediction of failure for a later reenlistee sample was marginal. Future research directions are suggested. (Author)

AD-A070 744/8GA PC **A08**/MF **A01**
Army Natick Research and Development Command MA
Navy Mess Management Specialist Training: Opinion Surveys and Interviews.
Technical rept.,
Lawrence E. Symington, Earl S. Stein, Herbert L. Meiselman, and Eugene M. Nuss. Aug 77, 160p Rept no. NATICK/TR-79/005

Descriptors: *Naval training, Food service, Schools, Interviewing, Surveys, *Food service personnel, Qualitative analysis, Enlisted personnel, Quantity, Tables(Data).

Navy enlisted food service personnel (MS) wsere surveyed and interviewed as the medium for obtaining data concerning present MS training programs and possibilities for omissions/additions to the curriculum. Strikers, cooks, watch captains, and their supervisors in the fleet; school students, school instructors, and food management team members were all sampled. The major questions in all surveys and interviews were directed toward the quality and quantity of training.

AD-A070 772/9GA PC **A13**/MF **A01**
Office of the Chief of Staff (Army) Washington DC
Review of Education and Training for Officers (RETO). Volume 1. An Overview.
30 Jun 78, 288p
See also Volume 3, AD-A070 773.

Descriptors: *Army training, *Officer personnel, Army planning, Education, Military requirements, Reserve Officer Training Corps, Schools, Vocational guidance, Careers, Policies, Personnel management.

The Chief of Staff of the Army (CSA) directed in August 1977 that a Review of Education and Training of Officers (RETO) be conducted as a matter of importance. A massive data collection effort was undertaken shortly thereafter, including a description of every officer duty position, a comprehensive survey of officer opinions and attitudes, an extensive study of other systems (other services, foreign armies, industry, and academia), numerous interviews, and, of course, a review of literature previously published on the subject. The RETO product constitutes a system encompassing total career education and training needs. It extends from precommissioning through career completion, covers both Active and Reserve Components, and is adaptable to force expansion. It is consistent with the Officer Personnel Management System (OPMS), limits resource demands to those necessary to support bona fide requirements, and meets the challenges of the 1990's.

AD-A070 773/7GA PC **A99**/MF **A01**
Office of the Chief of Staff (Army) Washington DC
review of Education and Training for Officers (RETO). Volume 3. The Data Base.
30 Jun 78, 667p
See also Volume 1 AD-A070 772.

Descriptors: *Military training, *Officer personnel, Education, Schools, Comparison, Military requirements, Reserve Officer Training Corps, Careers, Vocational guidance.

This annex examines the officer education and training programs of the United States Air Force, Navy and Marine Corps, and makes limited comparisons with related Army programs. No recommendations are made in this Annex.

AD-A070 780/2GA PC **A04**/MF **A01**
Naval Training Equipment Center Orlando FL
Training Considerations in Support of Refurbishment of Device 2F69D for the Naval Reserve.
Final rept.,
Leonard E. Ryan, John Smith, and Diane Planert.
Jun 79, 51p Rept no. NAVTRAEQUIPC-TN-60

Descriptors: *Flight training, *Flight simulators, Logistics management, Patrol aircraft, Pilots, Flight crews, Naval training, Military reserves, Naval air stations, Replacement, Repair, Military requirements, Logistics support.
Identifiers: OFT(Operational Flight Trainers).

This report was prepared in response to a NAVAIRSYSCOM task to initiate a study covering various possible degrees of refurbishing Device 2F69D which is scheduled for transfer to the Naval Reserve at NAS Willow Grove, Pa. Specific study objectives were to determine: the overall NAVRES/NAVRESASWTAC P-3 A/B training pipeline; specific pilot, copilot, and flight engineer training requirements; functional systems of the 2F69D OFT required to support identified training requirements; refurbishment/overhaul priority considerations of 2F69D OFT functional systems based on their overall contribution to training; alternative methods/media to support the NAVRES training program; e.g., cockpit procedure trainer and/or Device 2F78F (p-3 OFT); and 2F69D maintenance and logistic personnel support requirements. The recommendation in this report is to transfer Device 2F69D OFT from Brunswick, Maine, in an 'as is' condition, and initiate procurement of a new Device 2F87F. Cost savings based on flight hour reductions are discussed.

AD-A070 826/3GA PC **A02**/MF **A01**
Training Analysis and Evaluation Group (Navy) Orlando FL
Flight Hour Reductions in Fleet Replacement Pilot Training through Simulation.
Professional paper,
Alfred F. Smode. Jun 79, 25p Rept no. TAEG-TN-5-79
Invited paper presented at Conference, 50 Years of Flight Simulation, 23-25 Apr 79, London (England).

Descriptors: *Flight simulation, Flight training, Cost effectiveness, Pilots, Military training, Performance tests, Replacement.
Identifiers: P-3 aircraft.

It is only recently that the military has accepted training in the flight simulator as a substitute for training in the aircraft. A most compelling reason for this acceptance has been the fuel crisis. The emphasis on fuel economy as reflected in a United States Department of Defense planning goal, calling for a 25 percent reduction in hours flown by FY 1981, has intensified the interest in the cost savings associated with simulator substitution practices.

AD-A070 876/8GA Not available NTIS
Human Resources Research Organization Alexandria VA
Research in Military Training.
Professional paper,
Meredith P. Crawford. Nov 74, 12p Rept no. HUMRRO-PP-19-74
Availability: Pub. in The Encyclopedia of Education, v6 p379-383 1974. (No copies furnished by DDC).

Descriptors: *Military training, Military research, Education, Performance(Human), Skills, Reprints.

No abstract available.

AD-A070 887/5GA PC **A07**/MF **A01**
Human Resources Research Organization Alexandria VA
Evaluation of the DoD High School Testing Program.
Final rept.,
Gus C. Lee. Jan 79, 129p Rept no. HUMRRO-FR-PO-79-1
Contract MDA903-75-C-0128

Descriptors: *Aptitude tests, *Recruiting, Students, Vocational guidance, Military personnel, Personnel selection, Policies, Management, Cost effectiveness, Validation, Statistical analysis, Enlisted personnel.
Identifiers: High school students, ASVAB(Armed Services Vocational Aptitude Battery).

Beginning with a review of the 20-year history of the high-school testing program, this report examines the current policies, organization, and management structure; relationships between the educational community and the program; characteristics of test-takers; and estimates of accessions related to the program. The report includes chapters on establishing goals and measuring program performance, and on measuring the costs and benefits of high-school testing. The final chapter presents conclusions and recommendations. (Author)

AD-A070 937/8GA PC **A03**/MF **A01**
Technion - Israel Inst of Tech Haifa Faculty of Industrial and Management Engineering
Interpretations of Task Difficulty in Terms of Resources: Efficiency, Load, Demand, and Cost Composition.
Technical rept.,
David Navon, and Daniel Gopher. Nov 78, 46p AFOSR-79-0828, AFOSR-78-1
Grant AFOSR-78-3131

Descriptors: *Job analysis, Processing, Performance(Human), Tracking, Resources, Allocations, Time dependence, Efficiency, Cost effectiveness, Theory, Test construction(Psychology), Israel.
Identifiers: Workloads, Task analysis, Difficulty, Pursuit tracing.

The effect of task difficulty on performance can be conceptualized within a theory which posits that performance depends on the use of resources from a single pool. When the difficulty of a task is said to increase it may mean either that resources invested in it can now do less (i.e., a decrease in efficiency), or are now required to do more (i.e., an increase in load), or have now less time to do it (i.e., a stricter limit on processing duration). Either way, difficulty should most often interact with resource investment in such a way that effects of resource investment on quality or speed of performance are more pronounced the easier the task. If the processing system is viewed as comprised of a number of mechanisms each having its own capacity, whicy may be considered as a separate resource, then a difficulty manipulation may affect differentially the use of each of those capacities. If in a dual-task situation manipulation of the difficulty of one task affects the use of a mechanism which is not required by the other task, processing of the latter may remain intact under some circumstances. To get a complete picture of how difficulty affects dual-task performance, it is proposed to manipulate task preferences as well as difficulty parameters and to present their joint effect by families of POCs. Application of this methodology to the study of pursuit tracking is briefly described and interpreted in terms of multiple resources.

AD-A070 948/5GA PC **A08**/MF **A01**
RAND Corp Santa Monica CA
The Air Reserve Forces in the Total Force: Volume I. Overview and Analytical Approach.
F. J. Morgan, A. A. Barbour, R. M. Paulson, C. B. East, and C. B. Foch. Sep 77, 166p Rept no. RAND/R-1977/1-1-AF
See also Volume 2, AD-A070 949.

Descriptors: *Military reserves, *Air Force personnel, Flight training, Flight crews, Air Force training, Management planning and control, Policies, Missions, Cost effectiveness, National Guard, Operational readiness, Air Force planning, Personnel management.
Identifiers: Total Force analysis, Military Force mixes.

This report documents the research of a study which attempts to: Develop a comprehensive understanding of the military attributes and associated costs of Air Reserve Force (ARF) flying units, including an examination of the financial and operational impact of alternative organizational and managerial policies; and Develop an improved methodology to help Air Force planners and analysts derive preferred active/ARF mixes and select improved organizational and operational policies.

AD-A070 949/3GA PC **A05**/MF **A01**
RAND Corp Santa Monica CA
The Air Reserve Forces in the Total Force: Volume II. Cost Analysis and Methodology,
A. A. Barbour. Sep 77, 85p Rept no. RAND/R-1977/2-AF
See also Volume 1, AD-A070 948.

Descriptors: *Military reserves, *Air Force personnel, Flight training, Flight crews, Air Force training, Management planning and control, Policies, Missions, Cost analysis, Mathematical models, Air Force planning, Personnel management.
Identifiers: Total force analysis, Military force mixes.

In the fall of 1974, Rand began a study of total force options at the request of the Director of Plans, DCS/Plans and Operations, Headquarters U.S. Air Force. The study was to 'evaluate varying active/reserve force mixes in terms of total costs, capabilities, and responsiveness to and availability for peacetime/wartime requirements.' A research program was designed with the following objectives: (1) To compare the costs and relative capabilities of active and reserve flying units and their supporting elements; (2) To examine organizational and managerial improvements and innovations applicable to total force integration; and (3) To de-

velop a planning methodology for evaluating alternative active/reserve mixes and policies. The present report focuses on cost aspects of the study.

AD-A071 033/5GA PC **A08**/MF **A01**
Vought Corp Dallas TX
Air Combat Training: Good Stick Index Validation.
Final rept. 3 Apr 78-1 Apr 79,
Samuel B. Moore, Walker G. Madison, George D. Sepp, Jerrell T. Stracener, and Robert E. Coward. Jun 79, 159p AFHRL-TR-79-15
Contract F34601-77-A-0176

Descriptors: *Flight training, Flight maneuvers, Aerial warfare, Proficiency, Pilots, Skills, Flight simulators, Performance tests, Statistical analysis, Scoring, Performance(Human), Measurement, Automation, Validation, Test construction(Psychology), Students, Personnel selection, Mathematical prediction.
Identifiers: GSI(Good Stick Index).

The Good Stick Index validation study statistically investigated an empirically derived measure of pilot proficiency in an air combat simulator. Statistical methods, including regression and discriminant analyses, were used to evaluate GSI scores as predictors of student free-engagement performances in the Tactical Air Command Air Combat Engagement Simulator (TAC ACES I) simulator training program. Statistically derived performance predictors are obtained from objectively measured parameters recorded during simulator training. The effect of inclusion of student pilot demographic data with the objective data is investigated. Edumetric and psychometric data are presented as indicators of skill development. Results of the study yield performance predictors for four groupings within each TAC ACES I class; (a) winners, (b) winners or runners-up, (c) upper-half winners, and (d) student quartile ranking. The empirically derived measure shows a probability of winner prediction of 25 percent, whereas the statistically derived optimal measure shows a probability of winner prediction of 80 percent. The reliability of the performance predictors is assessed. Potential utilization and limitations of the Good Stick Index are addressed.

AD-A071 073/1GA PC **A07**/MF **A01**
Naval Postgraduate School Monterey CA
Alternative Approaches to the U.S. Navy Officer Evaluation System.
Master's thesis,
Richard Bernard McKenna. Mar 79, 126p

Descriptors: *Officer personnel, Reports, Performance(Human), Ratings, Benefits, Skills, Naval personnel, Vocational guidance, Personnel management, Theses.

Weaknesses of the present U.S. Navy Fitness Reporting System are reviewed and discussed. An alternative personnel evaluation system is proposed in order to take advantage of the benefits of several evaluative techniques. Different evaluation techniques would be used in the several phases of an officer's career. In the junior officer (developmental) phase, emphasis would be on management by objectives, stressing counseling and feedback. In the middle (staffing/managerial) phase emphasis would be placed on evaluation for selection and promotion. In the senior (executive) phase, the use of assessment centers is proposed. Finally, a list of recommendations is provided. (Author)

AD-A071 078/0GA PC **A04**/MF **A01**
Naval Postgraduate School Monterey CA
An Examination of Two Formal School Initial Specialized Training Pipelines with Respect to Retention.
Master's thesis,
Norbert Anthony Commons, Jr. Mar 79, 68p

Descriptors: *Training, Personnel, Distribution, Retention(General), Personnel retention, Theses.
Identifiers: Military training.

This thesis examines two formal school initial specialized training pipelines in order to determine if the present distribution of personnel in these pipelines could be modified to yield a higher retention rate. Over 80% of bootcamp graduates go directly to an initial specialized training 'A' school while only about 3% take the delayed school pipeline and return to 'A' school after having been to a fleet assignment following bootcamp. After making an adjustment to account for the loss that occurred during this time delay for the delayed school pipeline, a regression analysis was done to determine the effect of certain demographic characteristics on retention. It was found that marginal retention rate could be increased nearly 50% by greater utilization of the delayed training pipeline and at a significant reduction in training load. Such a shift would also result in a more preferable manning profile in the fleet because it produces more untrained sailors with less than one year experience where presently shortages result in 'A' school graduates being initially assigned menial tasks outside their specialty.

AD-A071 083/0GA PC **A03**/MF **A01**
Bowling Green State Univ OH
Principles of Work Sample Testing. IV. Generalizability.
Final rept. 15 Nov 76-15 Jun 78,
Robert M. Guion, and Gail H. Ironson. Apr 79, 36p ARI-TR-79-A11
Contract DAHC19-77-C-0007

Descriptors: *Job analysis, Performance tests, Measurement, Validation, Performance(Human), Education, Sampling, Case studies.
Identifiers: Generalizability.

Three kinds of generalizability are described: generalizability of test content, generalizability of relationships such as are described by validity coefficients, and generalizability of test scores across varying conditions. All are deemed important in the construction and evaluation of work sample tests. A special problem is determining the limits of generalizability; it is suggested that the research designs of generalizability theory can be applied in some cases to determining the limits of generalizability of criterion-related validities. This report, the last of four, is written for psychologists and others interested in theories of testing. (Author)

AD-A071 084/8GA PC **A02**/MF **A01**
Army Research Inst for the Behavioral and Social Sciences Alexandria VA
Effects of Combat Simulation on the Work-Related Motivation/Satisfaction of Participants.
Technical paper,
Robert H. Sulzen, and Paul R. Bleda. Mar 79, 22p Rept no. ARI-TP-351
See also Rept. no. ARI-TR-S-4, AD-A024 030, ARI-RR-1191, AD-A034 610 and ARI-RR-1192, AD-A043 515.

Descriptors: *Army training, Warfare, Simulation, Job satisfaction, Motivation, Careers, Battlefields.
Identifiers: Realtrain.

To improve both the combat readiness of Army units and the psychological rewards derived from training, the Army Research Institute has developed a group of techniques for simulating battlefield conditions. These techniques are known collectively as Engagement Simulation (ES). The squad and platoon level application of ES is referred to a REALTRAIN. REALTRAIN can be distinguished from more conventional training along a number of dimensions, including the degree of operating constraints in the exercises, type of casualty assessment, nature of evaluative feedback, and sequence of training procedures. A paper-and-pencil instrument was constructed that measured six different dimensions of job-related motivation and satisfaction. Results indicated that along four of the motivation/satisfaction dimensions (Attitude Toward the Exercises, Military Work Role, Unit Cohesiveness, and Leader Improvement), responses were more positive following participation in REALTRAIN than before participation. In the remaining two dimensions, there was no change in the 'before' and 'after' measures of motivation/satisfaction. However, for the conventional exercises, there was no change in the before and after responses of participants along five of the dimensions. Along the remaining one, there was a decline in the satisfaction level in the conventional training.

AD-A071 085/5GA PC **A03**/MF **A01**
Army Research Inst for the Behavioral and Social Sciences Alexandria VA
Effective Training for Target Identification Under Degraded Conditions.
Technical paper,
John T. Cockrell. Apr 79, 30p Rept no. ARI-TP-358
See also Rept. nos. ARI-TP-209 and ARI-TP-301, AD-A061 175.

Descriptors: *Army training, Targets, Identification, Learning.

This experiment explored the relevance of the psychological concept of overshadowing to military target identification training. The concept predicts that the most outstanding distinctive feature of a target will capture the attention of the trainee, who will pay little attention to other features. This prediction implies that soldiers will have a difficult time identifying degraded targets unless specifically trained on degraded targets. The experimental procedure was to force attention on more and more features of the targets by progressively covering the outstanding features. Results confirmed the relevance of overshadowing and suggested that most training should concentrate on degraded views. Psychologists interested in perception and in military target identification training are the intended audience for this report. (Author)

AD-A071 097/0GA PC **A03**/MF **A01**
Navy Personnel Research and Development Center San Diego CA
Bibliography of Unclassified Technical Reports, November 1977 Through September 1978.
Final rept.
Jun 79, 30p Rept no. NPRDC-TR-79-24

Descriptors: *Bibliographies, Reports, *Personnel management, *Naval training, Naval personnel, Acquisition, Manpower utilization, Performance(Human), Education, Management.

This report lists all unclassified technical reports which have been published during the period from November 1977 through September 1978. Reports are listed under the following four NPRDC product areas: Personnel Acquisition, Utilization, and Effectiveness, Human Performance in Navy Systems, Personnel Education and Training, and Personnel/Manpower Management. (Author)

AD-A071 101/0GA PC **A05**/MF **A01**
Seville Research Corp Pensacola FL
Development of a Course Outline for Training UH1FS Instrument Instructor Pilots.
Technical rept. Aug 77-Mar 78,
Robert N. Isley, Edward J. Miller, and William D. Spears. Mar 79, 80p SEVILLE-TR-78-01, ARI-TR-79-A5
Contract DAHC19-77-C-0039

Descriptors: *Army training, *Flight training, Flight simulators, Pilots, Flight instruments, Instructions, Instructors, Instructional materials.
Identifiers: Courses.

This report presents an outline for a proposed course to train unit instrument instructor pilots to use the UH1FS effectively in instrument instruction. The documentation for the outline was guided by applicable portions of the Interservice Procedures for Instructional Systems Development (ISD). The outline describes a largely self-contained, multi-media, self-instructional training package that could be developed for export to Army field sites having the simulator. This report should be of primary interest to personnel charged with the subsequent development of the proposed course, but it should be of general interest to others engaged in applying the ISD model in training program design. (Author)

AD-A071 106/9GA PC **A03**/MF **A01**
Canyon Research Group Inc Westlake Village CA
Development of an Objective Grading System Along with Procedures and Aids for its Effective Implementation in Flight.
Research note. 15 Nov 77-14 Nov 78,
Jerry M. Childs. May 79, 37p FTR-09-79, ARI-RN-79-18
Contract DAHC19-77-C-0008

Descriptors: *Scoring, *Flight training, Inflight, Performance(Human), Measurement, Proficiency, Maneuverability.

This report contains a description of the characteristics and test of two alternative inflight scoring procedures. These procedures were designed to meet the requirements of (1) minimal data collection, and (2) objective scores for Initial Entry Rotary Wing (IERW) student performance on Basic Instrument maneuvers. The procedures were criterion-referenced, employing different performance criteria, sampling techniques, and scoring algorithms. They were subjected to tests in the UH-1 simulator to assess the potential value of various characteristics within each procedure for meeting the requirements. Results of the tests provided general indications of those characteristics which best discriminated proficiency within and among students across training days. (Author)

AD-A071 119/2GA PC **A05**/MF **A01**
System Development Corp Santa Monica CA
Results of an Assessment of the Navy Leadership and Management Education and Training (LMET) Leading Petty Officer (LPO) Course.
Final rept.,
Margaret E. Minton, Katherine J. Saad, and Gloria L. Grace. 23 Mar 79, 89p Rept no. SDC-TM-(L)-6361/000/00
Contract N00600-78-D-0651

Descriptors: *Leadership, Officer personnel, Naval personnel, Management, Education, Training.

This report presents results of an assessment of the Leadership and Management Education and Training (LMET) Leading Petty Officer (LPO) course held at the Naval Amphibious Base, Little Creek, Virginia, from 20 February through 2 March 1979. This course was designed to increase the effectiveness of Leading Petty Officers by providing them with competency skills found to be associated with superior performance in this billet. Two Navy instructors conducted the course that was assessed and 27 First Class Petty Officers participated as students in this course. Eleven conclusions were drawn regarding the ability and proficiency of the Navy instructors to teach the course effectively. Five conclusions were drawn concerning the evaluation of the course materials and modifications as they affected course delivery. Due to insufficient data, only one general conclusion was drawn with respect to the third evaluation objective which was concerned with the assignment of Navy instructors to deliver the LPO course. Based upon these conclusions, eight recommendations were made concerning improvements for the LPO course.

ED-162 657 Not available NTIS
Grant Wood Area Education Agency. Cedar Rapids, IA.
Reel Communication: Objective Film Use,
JoEllen Johnson, and Clifford J. Ehlinger. May 78, 39p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$2.06, MF$0.83 Plus Postage.

Descriptors: *Elementary secondary education, Film criticism, *Films, Instructional media, Questionnaires, Surveys, Teachers, *Use studies.

A questionnaire designed to identify both general and specific film usage patterns was sent to 500 randomly selected K-12 teachers in the Grant Wood Area Education Agency area in Iowa. This report provides a brief discussion of the use of film in education based on Himstreet and Baty's Hierarchy of Methods and Dale's Cone of Experience, a review of the responses to the questionnaire, and suggestions for effective film use. A copy of the questionnaire and graphs summarizing teacher responses are included.

ED-162 667 Not available NTIS
Maine Univ. at Orono. Raymond H. Folger Library.
Workbook. Library Instruction Series,
Clara Kamerling Flower. 1977, 40p
For related documents, see IR 006 698-701.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$2.06, MF$0.83 Plus Postage.

Descriptors: Autoinstructional aids, Classification, Dictionary catalogs, Indexes(Locaters), Learning modules, *Library instruction, Library skills, Newspapers, Periodicals, Scholarly journals, *University libraries, Workbooks.

The exercises in this workbook are designed to be used with the pamphlets and audiotapes from Units II and III of the library skills modules for college students. Questions in these exercises are similar to those on the tests for the modules. Exercises 1 through 8 coordinate with Unit II: Card Catalog; exercises 9 through 11 relate to Unit III: Indexes and Abstracts.

ED-163 903 Not available NTIS
Athabasca Univ., Edmonton (Alberta).
An Assessment of an Audiotutorial Approach to Learning,
Trilochan S. Bakshi, and Lily Oddie. 9 Jan 78, 140p
Prepared in cooperation with Alberta Dept. of Advanced Education, Calgary.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$7.35, MF$0.83 Plus Postage.

Descriptors: Audiotape recordings, *Autoinstructional aids, *Biology instruction, Curriculum evaluation, Formative evaluation, Higher education, Instructional innovation, Media research, Program evaluation, Tutorial programs.
Identifiers: *Canada(Alberta).

This study investigated the appropriateness both to the delivery system and to students of Athabasca University of the audiotutorial method of instruction in an introductory level Biology course, which used selections of audiotutorial materials from 'Minicourses in Biology.' Evaluation data were gathered by using pre-post test (content) results, time sheets, post cluster questionnaires (cognitive, affective, and instructional concerns), activity sheets, personal interviews, and credit examinations. Student enthusiasm was high, and a significant pre-post test improvement was evidenced in student achievement across clusters. Problem areas identified in the course included sequencing of clusters; clear differentiation to students of pre-, post-, and in-house laboratory activities; length of course; availability of packaged materials; and technical demands of delivery of live organisms in winter. This course, with appropriate modifications, was found suitable for offering to larger numbers of Albertans.

ED-163 907 Not available NTIS
Welsh Joint Education Committee, Cardiff.
Teaching and Learning in the TEC Era.
Nov 76, 93p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$4.67, MF$0.83 Plus Postage.

Descriptors: Change strategies, Course objectives, *Curriculum development, Educational assessment, Educational strategies, *Educational technology, Inservice teacher education, Instructional improvement, Policy formation, Student testing, Teaching techniques.
Identifiers: Technician education council, Wales, Great Britain.

A series of short courses was presented on various aspects of curriculum practice to enable teachers to review and reconsider established practices, to acquire knowledge of recent and impending developments, and to gain experience in the techniques involved. This collection of rewritten versions of lectures given at these classes is divided into two parts. Three sections in the first part focus on objectives, assessments, and activity-based learning situations, while the final section is an effort to reconcile the problems of preparing worthwhile objectives relating to transferable mental skills and personal qualities with the need to make valid assessments. The second part provides examples, based on teacher ideas and experiences, of activity-based teaching-learning situations demonstrating the implementation of the principles discussed.

ED-163 911 Not available NTIS
Ohio State Library, Columbus.
Overview of Audiovisual Resources in the State of Ohio,
John W. Mitchell, and Judith K. Meyers. 1977, 507p
Sponsored in part by Office of Education, Washington, DC.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, MF$1.00 Only, Plus Postage.

Descriptors: *Audiovisual aids, Audiovisual programs, Catalogs, *Educational resources, Film libraries, Higher education, Information networks, Library services, Program coordination, Public schools, Questionnaires, State government, State surveys, Statewide planning, Tables(Data).
Identifiers: *Ohio.

A survey was conducted to (1) identify the major collections of audiovisual resources, especially 16mm films, in the state of Ohio; (2) describe trends in the development of such collections; (3) determine patterns of utilization; and (4) identify policy issues for the development of collections and services. This report details materials, equipment, services, utilization, procedures, interagency cooperation, and needs and priorities in terms of area, corporations, government agencies, libraries, school districts, and post secondary educational institutions.

HRP-0025944/0GA Not Available NTIS
American Nurses' Association, Kansas City, MO.
Guidelines on Educational Preparation and Competencies of the School Nurse Practitioner.
1977, 4p
Pub. in the Jnl. of School Health, v48, n5, p265-268, May 78.

Descriptors: Child health services, Continuing education, Health care services, *Health manpower education, Health manpower, Health occupations, Health resources, Job analysis, *Nurses, Personal health services, Public health nurses, Public health services.

Proposed guidelines on educational preparation and competencies intended by the American Nurses' Association, the American School Health Association, and the Department of School Nurses/National Education Association to expand the traditional role of the school nurse practitioner are reported. School nurses' responsibilities include procuring of the child's health history and physical appraisal, evaluating of developmental status, counseling children and parents, helping to manage child health influences, participating in health screening programs, managing minor illnesses, and assisting in child health need planning. School nurse practitioner programs seek to prepare nurses to provide improved child health care through cooperation with health professionals and educators. Required competencies discussed range from child health advocacy to emergency services to evaluation of nursing practice in the school setting. Planning for school nurse practitioner education programs should involve representatives of nursing, medicine, the school system, and the community. When possible, the programs should be conducted in health centers, under the aegis of accredited baccalaureate nursing programs, and should have adequate clinical facilities, guided practice, and a competent multidisciplinary faculty. The curriculum should cover growth and development, interviewing and counseling, family dynamics, positive health maintenance and health education, childhood illness, exceptional children, mental health, community resources and child health services delivery, clinical experience, and family/nurse/physician/school interaction. Baccalaureate nurse preparation and a position in a school system are preferred for admission to the program, which should encompass one intensive semester followed by a 6-to-8-month supervised preceptorship period. All aspects of the education program should be evaluated and standards for practice established.

HRP-0026417/6GA Not Available NTIS
Colorado Univ. Medical Center, Denver. School of Nursing.
On 'Problems' With Integrated Curricula in Nursing.
Barbara K. Redman. 1978, 4p
Pub. in Jnl. of Nursing Education, v17, n6, p26-29, Jun 78.

Descriptors: *Curricula, Health care services, *Health manpower education, Health occupations,

*Nurses, Nursing services, Nursing, Personal health services.

Problems with integrated curriculums in nursing are explored. The first problem is said to be that the movement to change the curriculum started with a solution instead of with a complete definition of the problem. The second problem is the incomplete development of curriculum models in nursing intervention. It is suggested that the effectiveness and efficiency with which skills are being learned must be examined. The third problem is said to be confusion about evaluation. Norms for outcomes from curriculum evaluation have not been clearly defined. The range of evaluation is said to have been limited by the use in nursing of a more limited process of development than is known and frequently practiced in education. Nurses have been deprived of multiple site evaluations. These problems are said to all be amenable to correction. A figure presents a crosshatching design of patients' states and nursing skills.

HRP-0026420/0GA Not Available NTIS
Prince George's General Hospital and Medical Center, Cheverly, MD.
Staff Development -- A Living, Growing Organism.
Clarisse Belanger. 1978, 8p
Pub. in Supervisor Nurse v9 n6 p16ff Jun 78.

Descriptors: Curricula, Development, Health care services, Health care, *Health manpower education, Health manpower, Health occupations, Maryland, Measurement, Medical personnel, Methodology, *Nurses, Nursing services, *On job training, Performance tests, Personal health services, Quality assurance, Registered nurses, State regions, Training programs.

A staff development program was initiated in 1975 and 1976 at Prince George's Hospital Center in Maryland using a systems approach. The objective was to provide new staff nurses with systematic learning experiences, to evaluate their performance according to set criteria, and to realize the growth potential of each nurse. An orientation program designed to introduce new staff nurses into the hospital system and to assure that they are safe practitioners consists of 2 weeks of classes and 4 weeks of clinical experience. Preliminary evaluation occurs after 6 weeks, with the possibility of one extension. The second phase (Staff Development I) encourages skill development through 2-hour weekly classes for 6 to 7 weeks with lectures, standardized materials, and procedure demonstration. Problems encountered at this level are the reluctance of nurses to be evaluated and lack of required situations involving patients. Phase three (Staff Development II), which furthers problemsolving ability and in-depth understanding of particular procedures, requires written studies of specific care plans and implementation. A special phase one program initiated in 1977 for nursery, labor and delivery, and postpartum nurses is also discussed briefly. Results evident after phase two indicate improved nursing history data collection and nursing care plans, better bedside teaching, more frequent rotation of injection sites and more competent teaching of presurgery techniques to patients (i.e., diaphragm breathing). Five figures with a sample evaluation form and outlines of progressive phases are included.

HRP-0026445/7GA Not Available NTIS
Virginia Commonwealth Univ., Richmond. School of Nursing.
Marketing Your Program.
Jewell R. Calderon. 1978, 3p
Pub. in Jnl. of Continuing Education in Nursing, v9, n3, p12-14, 1978.

Descriptors: *Continuing education, Economic theory, Economics, Health care services, Health care, *Health manpower education, Health occupations, *Nurses, Nursing services, Nursing, Personal health services.

The use of marketing techniques for selling continuing education programs in nursing is justified. It is argued that the marketing concept as a carefully designed program to bring about voluntary exchanges of values with target markets is useful when applied to educational services. Three marketing styles are distinguished: aggressive marketing with promotion and high pressure selling; minimal (no-sell) marketing, which emphasizes the design of the product; and balanced marketing, which simultaneously sells the product and meets consumer needs. It is not valid to assume that an educational program will sell itself, because potential clients often need assistance in selecting suitable education. Nurses frequently have difficulty matching their needs with available offerings, as they have no training in distinguishing between quality programs and those with a slick format. They may simply not know what options exist. Providing quality continuing education programs at low prices without State support depends on high enrollment. Proper marketing requires research on eduation needs and creation of programs to meet needs with the guiding principles of: right product, right price, right promotion, right place, and right partners. A short bibliography is furnished.

HRP-0026523/1GA Not Available NTIS
Evergreen Valley Coll., San Jose, CA.
Variables Associated with Student Mastery of Learning Modules.
William P. Osborn, and Martha A. Thompson. 1977, 13p
Pub. in Communicating Nursing Research, v9, p167-179, Apr 77.

Descriptors: California, Curricula, Health care, *Health manpower education, Health occupations, *Nurses, Nursing, Research, Sociology, State regions.

This study attempted to determine noncognitive factors that may affect student mastery of content with a particular instructional format and the degree of individualization achieved with the independent study of learning modules. In addition, an effort was made to provide data that could be used in evaluation of a modular learning format and in future curricular applications of the teaching strategy. The study population consisted of students from six campuses of the California state university and colleges system who were enrolled in nursing courses using any of 18 modules developed under an intercampus nursing project. Eleven noncognitive factors were used as independent variables: the extent of close-mindedness, the extent of previous experience with modular learning, the number of hours spent studying a module, the extent to which the student felt that his or her role had been changed with the use of modules, the type of module according to the degree of active student participation required, the primary focus in a course, scoring controls for module posttests, perceived success with a module, perceived adequacy of a module as preparation for taking the posttest, perceived applicability of a module to further clinical experience, and perceived experiential success for actual clinical experience. There were 237 posttest scores provided from the six campuses. Scores ranged from 51 to 100, with 78.9 percent of the scores at 90 and above. This indicated a high degree of success on most posttests. Verbal scores were obtained for 555 students. The most significant finding of the study was that any instructional technique requiring a high level of autonomous functioning may not always be in the best interest of close-minded students.

HRP-0026524/9GA Not Available NTIS
Texas Univ. Medical Branch at Galveston.
Interaction Between Internal-External Preference and Response to an Overt or Covert Treatment in a Programmed Instruction Task Among Nursing Students.
Anne Loustau. 1977, 11p
Pub. in Communicating Nursing Research, v9, p155-165, Apr 77.

Descriptors: Curricula, Health care, *Health manpower education, Health occupations, *Nurses, Nursing, Registered nurses, Research, Sociology, State regions, Washington(State).

A study was designed to investigate an attribute-by-treatment interaction between variables that might be relevant to the individualization of instruction for nursing students. The subject's internal-external preference for control was the attribute measure. The treatment variable was exposure to either an overt or covert approach to a programed instruction task. The specific study issue was whether there is an attribute-by-treatment interaction between a student's internal-external preference and her response to an overt-covert variation of a programed instruction task. Subjects were 102 volunteer women nursing students enrolled in the first quarter of the associate degree program at Everett Community College in Everett, Wash. The design for the study was a two-way factorial design. The hypothesis that overtly treated external subjects would obtain higher scores on post-learning measures was not supported. Although scores for internal subjects were similar under both overt and covert treatment conditions, external subjects failed to obtain higher scores under the overt treatment condition. There was a significant difference between the overt and covert groups in terms of the amount of time spent on programed instruction. Overtly treated subjects spent less time on posttests than covertly treated subjects. Contrary to prediction, there was no differential overt-covert treatment effect on scores for multiple-choice and constructed response test items. It is concluded that the attribute-by-treatment approach is a usable method for further investigations regarding success in learning tasks and the individualization of instruction. Supporting data are provided.

HRP-0026574/4GA Not Available NTIS
Southern Illinois Univ. at Edwardsville. School of Nursing.
Self-Assessment of Continuing Education Needs.
Gloria R. Burgess. 1978, 4p
Based on an address presented at a conference on 'Assessment for Learning Needs' held at St. Louis Univ.
Pub. in International Nursing Review, v25, n3, p89-92, 1978.

Descriptors: *Continuing education, Health care services, *Health manpower education, Health occupations, *Nurses, Nursing services, Personal health services, Vocational guidance.

A discussion of self-assessment of continuing education needs in nursing is provided. Career guidance for nurses has been virtually nonexistent, and the need for such guidance is emphasized. Nurses are encouraged to make a list of possible learning goals and to think of alternative ways of meeting those goals. It may be well to follow a step-by-step plan in setting career objectives. A newspaper account of a woman who followed such a plan is summarized. It is pointed out that when one enters the nursing profession, one makes a lifelong commitment to learning. Becoming an effective nurse is said to be just that -- becoming. It is a matter of growth and the growth occurs slowly, over a period of time. As the country moves toward Government intervention in health care delivery, the nursing profession is coming under closer and closer scrutiny. Each nurse, it is said, must develop a personal system of accountability, just as the health care system is striving to develop a system of accountability to the consumer. Individual education patterns must be determined and plans for the future must be made. First of all, it is stressed, the nurse is accountable to herself.

HRP-0026993/6GA Not Available NTIS
American Coll. of Cardiology, Bethesda, MD.
Growth of Continuing Medical Education.
Robert K. Richards. 1978, 16p
Pub. in the Yale Jnl. of Biology and Medicine v51 n2 p219-234 1978.

Descriptors: *Continuing education, Health care services, *Health manpower education, Health occupations, Medical services, Personal health services, *Physicians.

Increasing concern with and participation in continuing education in medicine is discussed. From 1940 on, a major change in attitudes toward the need for continuing medical education has been apparent. Since that time, the medical profession, medical educators, and Government agencies have studied continuing medical education as a concept, developed standards, assessed methods, and invented approaches to this latter phase of medical education. The first requirement for continuing medical education was instituted in 1947 by the constitution of the American Academy of General Practice (now the American Academy of Family Physicians). In 1950, institution of continuing medical education courses in medical schools was proposed, and in 1955, a preferred method for continuing medical education, consist-

ing of reading, formal courses, professional contacts, and medical society functions was suggested. Further study and development of continuing medical education occurred throughout the 1960's, and the present state of development is such that continuing education for medical professionals is considered a requirement for the best medical practice. Accreditation of such programs began in the 1960's. Emphasis in educational programs for practicing physicians has been placed on hospital practice, but some criticism of this orientation has followed. There is also strong criticism concerning the cost-benefits attributable to continuing medical education. Further evaluation of the effectiveness of such programs in terms of improved medical knowledge and practice is recommended.

HRP-0027242/7GA Not Available NTIS
Illinois Univ. at the Medical Center, Chicago. Coll. of Nursing.
Bedside Clinic -- Nursing Rounds as a Teaching Strategy.
Lois Malasanos, and Anna Marie Tichy. 1977, 6p
Pub. in Jnl. of Nursing Education v16 n6 p10-15 Jun 77.

Descriptors: Adult education, Child health services, Health care delivery, Health care services, Health care teams, *Health manpower education, Health occupations, Inpatient services, Methodology, *Nurses, Nursing services, Nursing, On job training, Personal health services, Theories.

The use of nursing rounds as an effective teaching device, especially for communication and interpersonal skills, is discussed. For teaching interviewing skills, rounds offer a real-patient situation, immediate evaluation possibilities, and instructor role models, while fostering peer review. Different rounds-teaching techniques include a formal presentation of the patient case by the admitting resident, followed by a discussion period; a classical bedside approach with introduction of staff members to the patient and a group discussion; a total rounds procedure in which even the initial patient interview is conducted by the group at the bedside; use of the bedside experience to explore a single problem, particularly affective phenomena; or utilization of a series of bedside visits to illustrate a particular treatment course, e.g., burn treatment. A general nursing rounds clinic to teach all facets of the clinical problemsolving process involves acquisition of theoretical knowledge through reading assignments, initial introductory rounds with an instructor and students, followed by student-conducted rounds after students have worked in the unit for a week, inclusion of the patient in activities and planning, class discussion after the bedside visit, and a postclinic conference. These techniques, which promote team involvement, brainstorming, and consistency of care, have been very useful for pediatric and genitourinary unit training.

HRP-0027519/8GA Not Available NTIS
Association of Univ. Programs in Health Administration, Washington, DC.
Financial Management Education in Health Administration Programs.
Nov 78, 31p
Available from Association of University Programs in Health Administration, One Dupont Circle, Washington, DC 20036.

Descriptors: Administration, *Financial management, Financing, Health care delivery organizations, Health care delivery, Health care facilities, Health care requirements, *Health manpower education, Health manpower, Health resources, Manpower requirements, Medical personnel.

The status and main issues of financial management education are discussed. Financial management is defined, in its broadest sense, as the process of seeking the optimal financing, allocation, and control of all resources of the health care organization. In terms of subject content, it consists of five areas: payments to health care institutions; planning, budgeting, and controlling; management of current operations and working capital; investment decisions; and sources of financing. Data collected from 1970 and 1977 surveys reveal some significant changes in the status of financial management education. Its concepts and techniques are being integrated into the overall health care administration curriculum. There is also more emphasis on decisionmaking and problemsolving; courses 8 years ago were frequently only descriptive. At present, the demand for financial management graduates far exceeds their numbers. Graduates are needed in a number of settings, ranging from hospitals to community health centers and third-party insurance carriers. For health administration programs to be effective, they must have a data base to enable them to be responsive to a rapidly changing environment. Therefore, an inventory of the marketplace for health care financial managers should be performed.

HRP-0027542/0GA Not Available NTIS
New South Wales Univ., Kensington (Australia).
Postgraduate Education for Health Administration -- The United States Experience.
George R. Palmer. Jan 78, 31p
Available from Association of University Programs in Health Administration, Suite 420, One Dupont Circle, Washington, DC 20036.

Descriptors: Accessibility, *Administration, Documents, Health care delivery organizations, Health care, *Health manpower education, Hospital administrators, Information systems, Long term care administrators, Methodology, Sources, United States.

While U.S. health administration (HA) education has broadened in scope and achieved much higher academic standards than in the past, it may have sacrificed its close relationship with the field of practice. This view is based on visits to 14 accredited U.S. programs in health administration by the head of Sydney, Australia's HA program at the University of New South Wales. After presenting a historical overview of U.S. HA programs, this report focuses on current issues and problems in the field, i.e., a surplus of graduates for the job market and programs of less-than-optimal size. A major concern voiced is that relevance is being sacrificed to academic caliber. The quality of health administration programs as judged from the standpoint of providing manpower capable of functioning effectively in the health services is a matter of controversy. Furthermore, health educational programs face the fundamental problem of providing satisfactory courses in a situation where there is little agreement about the present or future roles of health administrators. A 28-item bibliography and 3 appendixes are included.

HRP-0028563/5GA PC **A07**/MF **A01**
Portland State Univ., OR. Inst. on Aging.
Statewide Program for Training Long-Term Care Provider Personnel. The Comprehensive Report.
Final rept.
1978, 135p
Contract PHS-HRA-230-77-0120
See also Summary, HRP-0901267.

Descriptors: Age groups, Aging(Biology), Classifications, Clinical medicine, Communities, Curricula, Demography, Facilities, Forecasting, Geriatrics, Gerontology, Health care services, Health care technology, Health care, *Health manpower education, Health occupations, Inpatient services, *Long term care, Methodology, Nurses, On job training, Oregon, Personal health services, Requirements, Schools, Universities.

This project was initiated to provide ongoing training for long-term care personnel in Oregon; emphasis was placed on continuity through coordination with groups and associations involved in long-term care. Five objectives were: to initiate communication and collaboration among organizations, to increase the number of training opportunities, to conduct a series of training programs and coordinate them with other programs in the State, to determine the effectiveness of training programs for long-term care personnel and provide a basis for planning, and to assure that training opportunities are self-sustaining when Federal funding is withdrawn. An advisory committee was established that became a clearinghouse for information about long-term care training. Four subcommittees were formed; they focused on long-range planning, planning for psychosocial training, a 'train the trainer' workshop, and planning for an interdisciplinary approach to patient care. Training needs were identified as psychosocial aspects of long-term care, management skills, activity programing, communication disorders of nursing home residents, dental care for the elderly, the process of aging, rehabilitation, and death and dying. Evaluation and long-range planning were important aspects of the project. Detailed information about the project and the calendar of training events are appended.

HRP-0029002/3GA Not Available NTIS
Idaho State Univ., Pocatello. Dept. of Nursing.
Rural Practice Setting Influences Idaho Proposal.
Eileen H. Zungolo. 1979, 5p
Pub. in American Organization of Registered Nurses Jnl., v29, n1, p59-63, Jan 79.

Descriptors: Continuing education, Curricula, Health care services, *Health manpower education, Health occupations, Idaho, Licensed practical nurses, *Nurses, Nursing services, Nursing, Personal health services, Personnel development, Registered nurses, Retraining, *Rural health services.

The practice setting of nurses in the State of Idaho is explored, with particular emphasis on the dominance of small towns located in rural areas. It is contended that nurses who function in the rural setting need more preparation than that provided. Nursing education programs in the State include five associate degree, two baccalaureate, one generic, and one upper division. In the northern part of the State, nurses have no access to baccalaureate programs. The majority of nurses have diplomas, and licensed practical nurses are educated in vocational-technical schools and community school districts. The Commission on Nursing and Nursing Education in Idaho has initiated projects related to curriculums, primary care, refresher training, and career mobility. There is a need to establish standard minimum preparation for entry into nursing practice, but controversy exists over what such preparation should entail. The effectiveness and funding of baccalaureate nursing programs are discussed, and the educational approach to licensed practical nurse preparation is considered.

HRP-0029051/0GA Not Available NTIS
Wisconsin Univ.-Madison.
Human Sexuality Workshop -- A Continuing Education Program.
Fern H. Mims. 1978, 8p
Pub. in Jnl. of Continuing Education in Nursing v9 n6 p29-36 1978.

Descriptors: *Continuing education, Health care services, *Health manpower education, Health occupations, Medical services, Nurses, Nursing services, *Personal health services, Physicians, State regions, Wisconsin.

Continuing education is noted as one way of updating knowledge and practice and thus, professional accountability in the provision of sexual health care. Studies indicate that professionals are not always aware of or are not willing to acknowledge their competency level in sexual health care. Competency depends on certain skills, attitudes, and levels of knowledge. Considering the documented need for educational programs in human sexuality, the University of Wisconsin's Continuing Medical Education Department sponsored a multidisciplinary workshop. Topics addressed at the workshop were human sexual responses, sexual variations, common misconceptions, sexual concerns of adolescents, sexual value clarification, sexuality of the handicapped, and the treatment of sexual dysfunction. Of 132 professionals enrolled in the workshop, 93 subjects completed the 2-day program and were willing to participate in the workshop's evaluation. To test knowledge before and after the workshop, the Sex Knowledge and Attitude Test form and an evaluation form developed by the university were employed. The number of persons completing the workshop was highest among nurses. Nurses showed significant changes on autoeroticism, attitude, and knowledge scores before and after participating in the workshop. Physicians showed significant changes on sexual myth and autoeroticism scales. It is concluded that the workshop helped to increase awareness and eliminate biases, stereotypes, and taboos concerning human sexuality. Supporting data are provided.

HRP-0029362/1GA Not Available NTIS
Texas Univ. Health Science Center at San Antonio.

Rejected Medical School Applicant – Options and Alternatives.
Carlos Pestana. 1978, 212p
Available from Carlos Pestana, P.O. Box 32617, San Antonio, TX 78216.

Descriptors: *Foreign countries, Foreign medical graduates, *Health manpower education, Health manpower, Health resources, United states.

The objective of this book is to help rejected applicants to U.S. medical schools to understand why they were not accepted and to explore the options available to them. The introductory materials examine applications to medical schools in terms of numbers and trends and discusses the medical school admissions process. The discussion then turns to the three options available to the medical school applicant. Reapplication to medical school is considered first. Among the subjects addressed are the question of who should reapply, reapplication with identical and with better credentials, and where to reapply. The remaining chapters deal with medical education abroad, touching on such topics as the French and German patterns of medical education, medical education in Mexico, avenues of reentry, the Health Professions Education Assistance Act of 1976, top choices in European medical schools and concrete steps involved in going to medical school abroad, and with other career options (e.g., hospital administration, dentistry, veterinary medicine, public health, and research).

HRP-0901392/1GA PC **A05**/MF **A01**
Arizona State Dept. of Health Services, Phoenix. Bureau of Long-Term Care Facilities.
Arizona Long-Term Care Training Project. Phase I, 1977-1978.
Final rept.
1978, 83p
Contract PHS-HRA-230-77-0121

Descriptors: Adult education, Arizona, Continuing education, Curricula, Environmental health, Health care services, Health care, *Health manpower education, *Long term care, Mental health services, Methodology, On job training, Personal health services, Quality assurance, Sanitation, Theories.

The phase I activities of the Arizona long-term care training project intended to upgrade quality of care are summarized. Staff for the 1977 to 1978 project included a project coordinator and a project secretary, as well as an 18-member advisory committee representing various segments of the population. A total of eight approved continuing education programs covered training the trainer, an interdisciplinary approach to planning patient care, psychosocial/mental health, basic issues in sanitation, and basic issues in infection control. Expert consultants contributed their time to enriching program content. Problems encountered related to technical difficulties in getting materials printed in time, the tendency of participants to vent frustrations, and variance in attendance. Positive program spinoffs were formation of a long-term inservice association, preparation of a sanitation and infection control manual, development of self-instructional continuing education modules, and further program plans. Alternative fund sources are being developed with support of the advisory committee because the second phase of the program has been cancelled. Appendixes illustrate project structure, data and evaluation forms, and materials used for each program.

ORAU-152 PC **A02**/MF **A01**
Oak Ridge Associated Universities, Inc., TN. Manpower Education, Research and Tranining Div.
Interim Report: Basic Employment Skill Training Project.
K. Thompson, and M. Weseman. Nov 78, 22p
Contract EY-76-C-05-0033

Descriptors: Coal industry, *Coal miners, *Education, Manpower, US DOE.
Identifiers: ERDA/016000, ERDA/012000, Specialized training, Personnel development, Females, Minority groups, Veterans, Project planning.

For abstract, see ERA citation 04:025352.

PB-298 405/2GA PC **A07**/MF **A01**
Wharton School, Philadelphia, PA. Human Resources Center.
Human Resource Development Study of the Southeastern Pennsylvania Transportation Authority.
Final rept.
May 79, 128p UMTA-IT-09-0073-79-2
See also PB-298 161.

Descriptors: *Personnel development, *Manpower utilization, Labor relations, Industrial relations, Personnel management, Organization theory, Job satisfaction, Job analysis, Performance standards, Upgrading, Occupational mobility, Productivity, Industrial training, Management training, Personnel selection, Attitudes.
Identifiers: Labor turnover, Training.

An interdisciplinary research team of the Human Resources Center comprehensively investigated the existing and projected human resource development needs of the Southeastern Pennsylvania Transportation Authority (SEPTA). The objectives were to: (1) assist in determining the human resources development organizational needs of SEPTA; (2) identify the objectives to be met through human resource development training; (3) determine the organizational resources and constraints to meet identified needs; (4) develop alternatives to accomplish human resource training objectives; (5) develop a plan to implement a human resource development system; and (6) structure a human resource development evaluation model. The recommendations of the study are discussed and analyzed in the report.

PB-298 452/4GA PC **A03**/MF **A01**
Office of Personnel Management, Washington, DC. Personnel Research and Development Center.
Analysis of an Executive-Level Assessment Center: A Comparison of Assessment Center Ratings to Supervisor Ratings and to Biodata,
Hardy L. Hall. Apr 79, 32p TM-79/1

Descriptors: *Personnel selection, *Executives, Supervisors, Performance evaluation, Reliability, National government, Personnel management.

An assessment center, designed to aid in the selection of employees at the GS-15 level with the ability to assume executive-level managerial functions within the Federal government, was evaluated against supervisor ratings and selected biodata variables. The assessment center better differentiated between participants and supplied unique variance not explained by the supervisor ratings and the biodata. The center also had fewer rating errors, was more objective, and was more reliable than the supervisor ratings.

PB-298 455/7GA PC **A03**/MF **A01**
Office of Personnel Management, Washington, DC. Personnel Research and Development Center.
Job Analysis of Entry Level Firefighters in the District of Columbia Fire Department: Administration and Results of the Position Analysis Questionnaire (PAQ).
Final rept.,
Paul van Rijn. May 78, 26p TM-78/2

Descriptors: *Personnel selection, *Fire fighting, *District of Columbia, Job analysis, Surveys, Questionnaires, Tests, Aptitudes.

The report describes the results of the administration of the Position Analysis Questionnaire (PAQ) to four analysts familiar with the job of entry level firefighting in the District of Columbia Fire Department (DCFD). Comparisons of the DCFD data with results obtained in other firefighter studies show considerable similarities and suggest possible portability of personnel selection instruments.

PB-298 485/4GA PC **A03**/MF **A01**
Office of Personnel Management, Washington, DC. Personnel Research and Development Center.
Validity of Test 21 for Selection of Entry Level Firefighters in the DC. Fire Department.
Final rept.,
Sandra S. Payne. Apr 79, 30p PRR-79/4

Descriptors: *Personnel selection, *Fire fighting, Achievement tests, Abilities, Aptitudes, Validity, Specialized training, Minority groups.

The report describes the study of the validity and job-relatedness of the written Federal test (Test 21) currently used for selection of firefighters for the D.C. Fire Department. The abilities assessed by Test 21 are important for successful performance of the job, and that Test 21 is significantly correlated with all of the criteria (except the physical proficiency portion of the recruit training school grade) for the total sample of entry level firefighters, and for the white and black subgroup samples. A significant difference in validity for blacks and whites was found on only one criterion, the job information test, and was not found in the combined criteria score.

PB-298 489/6GA PC **A05**/MF **A01**
Applied Science Associates, Inc., Valencia, PA.
Revision of NHTSA Curriculum Packages.
Final rept. 1 Jun 76-30 Dec 77,
Z. Glasgow, M. L. Simkins, and T. P. Stamp. Dec 77, 78p DOT-HS-804 623
Contract DOT-HS-6-01376
See also report dated Jun 78, PB-292 519.

Descriptors: *Specialized training, *Personnel, Motor vehicle accidents, Traffic safety, Medical personnel, Training devices, Ambulances, First aid, Instructional materials, Highway transportation.
Identifiers: *Curricula.

The report describes the conduct of a contract for the revision of three NHTSA curriculum packages for Emergency Medical Technicians (EMT): EMT - Refresher, EMT - Dispatching, and EMT - Crash Victim Extrication. The project was conducted in two phases. Each of sixteen curriculum packages was evaluated during Phase I, and ranked according to a set of criteria developed by the contractor and NHTSA. As a result of this ranking and NHTSA's concurrence, the three packages were selected for revision. The actual revision of the curriculum was the work of Phase II. A number of general editorial and stylistic changes were made to each package. Other revisions were directed at the needs of each package, including updating content and improving the teaching effectiveness of the manner in which the material is presented. Field trials of the Refresher and Crash Victim Extrication packages were conducted, and the packages revised on the basis of the findings.

PB-298 533/1GA PC **A12**/MF **A01**
National Research Council, Washington, DC. Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel.
Personnel Needs and Training for Biomedical and Behavioral Research. Volume 1.
Final rept.
Sep 77, 273p NIH-75-1-1
Contract N01-OD-5-2109
See also report dated Jun 76, PB-258 534 and Volume 2, PB-298 534.

Descriptors: *Behavioral sciences, *Scientists, Financing, National government, Personnel development, Research, Recommendations, Assessments, Manpower, Requirements, Health care services, Clinical medicine.
Identifiers: *Medical research, *Scientific research, Training programs.

Of special interest in the 1977 report are the results of a survey of a sample of 14,300 of the country's younger biomedical and behavioral scientists; a discussion of the situation of minorities and women in the biomedical and behavioral sciences; and recommendations which address some of the policies and administrative aspects of the National Research Service Award Act program.

PB-298 534/9GA PC **A09**/MF **A01**
National Research Council, Washington, DC. Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel.
Personnel Needs and Training for Biomedical and Behavioral Research. Volume 2: Appendixes.
Final rept.
Sep 77, 192p NIH-75-1-2
Contract N01-OD-5-2109
See also Volume 1, PB-298 533.

Descriptors: *Behavior sciences, *Scientists, Financing, National government, Personnel development, Tables(Data), Research, Recommendations, Assessments, Manpower, Requirements, Health care services, Clinical medicine.

Identifiers: *Medical research, *Scientific research, Training programs.

The report for 1977 is the third in a series of annual reports prepared by the Committee on a Study of National Needs for Biomedical and Behavioral Research Personnel in a continuing study that was established pursuant to the provisions of the National Research Service Award Act of 1974 (Public Law 93-348). In this report, the Committee discusses the current status of the labor market and the near-term outlook for research personnel in the four broad areas into which the study has been organized--basic biomedical sciences, behavioral sciences, clinical sciences and health services research. In accordance with the provisions of the Health Research and Health Services Amendments of 1976, which extended the authority of the Act, the Committee this year for the first time reports upon research training needs and issues in nursing research. The Committee has again made specific recommendations about the numbers of individuals to be supported by the research training programs of the National Institutes of Health, the Alcohol, Drug Abuse and Mental Health Administration, and the Health Resources Administration. Recommendations also speak to the division of support between predoctoral and postdoctoral training.

PB-298 536/4GA PC **A07**/MF **A01**
Washington Univ., St. Louis, MO. Dept. of Economics.
The Components of Non-Market Time and Female Labor Supply Patterns.
Final rept.,
Donald Allan Larson. 20 Jun 79, 131p DLMA-91-29-76-62-1
Grant DL-91-29-76-62

Descriptors: *Females, *Employment, Flexibility, Economic analysis, Economic models, Children, Statistical analysis, Patterns, Theses.
Identifiers: Labor supply, Labor market.

The study examines the determination of labor supply patterns (in terms of hours per week and weeks per year) for married women. The analysis proceeds by defining two distinct types of nonmarket time which are uniquely associated with the labor supply patterns. A theory of demand for these 'leisure' components is developed and estimated empirically using data from the National Longitudinal Survey of Women 30-44. The results indicate that women are not indifferent to the pattern of work time and that their choices are related to a number of economic and demographic factors. In particular, annual weeks is found to have a substantially higher, positive elasticity than weekly hours.

PB-298 553/9GA PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Community and Economic Development Div.
Effect of the Department of Labor's Resource Allocation Formula on Efforts to Place Food Stamp Recipients in Jobs (A Supplement to Comptroller General's Report CED-78-60, April 24, 1978).
Report to the Congress.
15 Aug 79, 46p CED-79-79

Descriptors: *Resource allocation, *Placement, *Employment, National government, Financial management, Allocations, Incentives, Welfare, Social welfare, Federal assistance programs, Purchasing, Food, Auditing, Evaluation.
Identifiers: *Department of Labor, *Food stamps, Employment programs.

Labor has used its formula to allocate about one-third of the $1 billion in Federal funds provided to State employment service agencies annually. A new allocation system is being developed for use starting in fiscal year 1980. The formula's effect on State agencies' efforts to place food stamp recipients in jobs is not clear. However, several factors, including no explicit incentive for placing these recipients, could discourage such efforts. The Congress and the executive branch will need to decide on a special preference for food stamp recipients. Labor gets $28 million a year from the Department of Agriculture for food stamp work registration activities, but the services these funds are to cover are not clearly defined. The Office of Management and Budget should help clarify this matter.

PB-298 560/4GA PC **A07**/MF **A01**
New York State Economic Development Board, Albany.
The Unemployment Insurance Tax Structure in New York State. An Analysis of its Impact on Seasonal Industries and an Evaluation of a Systematic Formulation of Alternative Tax Tables.
Final rept.
1979, 143p
Grant EDA-OER-571-G-77-17

Descriptors: *Unemployment, *Insurance, *Taxes, *New York, Income taxes, Businesses, Employment, Payment, Seasonal variations, Industries, Revenue, Welfare, State government.
Identifiers: *Unemployment insurance, *Tax structure, Employers, State programs, Employment trends, Financial support.

The report provides material useful to the development of a new tax table of unemployment insurance payroll tax rates. After a review of the New York State Unemployment Insurance program, discussion shifts to evaluation of experience rating (variable tax rates indexed to a firms employment record) and the impact of experience rating on seasonal industries. Finally, the 'Mercer Model' developed for the New York State Department of Labor and used to project an actual or proposed tax plan through various employment cycles is analyzed.

PB-298 580/2GA PC **A03**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Air Programs.
Final rept. on Phase 3.
Aug 79, 39p* EPA/600/8-79/023A
Grant EPA-T900591-03
See also Phase 1, PB-277 835, Phase 2, PB-291 174, and PB-298 581.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Specialized training, Air pollution, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The directory provides information on post-secondary environmental education programs in the United States. Structured around information requests mailed to post-secondary education institutions, the directory provides the name and address of each institution listed, a contact person at each institution, the academic program title, and the degree offered at the institution (2-year, 4-year, etc.). Phase III includes twelve such directories of post-secondary programs: One each for air, noise, pesticides & toxicology, potable water, wastewater, radiation, solid waste, and energy; one for combined water/wastewater programs; and a composite volume on each of the three areas of environmental engineering/technology, environmental science/health, and environmental studies.

PB-298 581/0GA PC **A03**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Noise Programs.
Final rept. on Phase 3.
Aug 79, 29p* EPA/600/8-79/023B
Grant EPA-T900591-03
See also PB-298 580 and PB-298 582.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Specialized training, Noise, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The volume includes all identified post-secondary education and/or training programs which have been selected as pertinent to one media-specific area; noise. For ease of handling, the programs are presented in alphabetical order according to the name of the institution. The Appendix, however, presents a listing of the institutions by state, with reference to page numbers.

PB-298 582/8GA PC **A05**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Pesticides and Toxicology Programs.
Final rept. on Phase 3.
Aug 79, 94p* EPA/600/8-79/023C
Grant EPA-T900591-03
See also PB-298 581 and PB-298 583.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Pesticides, Toxicology, Universities, Directories, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The topics of pest management and toxicology demand exacting technical and scientific skills, expertise, and experience. As the pressure grows to maintain high crop yields, while keeping the level of pollutants and toxicants within the federal guidelines, the need for appropriate academic, research, and vocational education and training multiplies. In total, 135 pesticides or toxicology program entries are presented in this volume. The programs represent certification training through doctoral level offerings.

PB-298 583/6GA PC **A03**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Potable Water Programs.
Final rept. on Phase 3.
Aug 79, 41p* EPA/600/8-79/023D
Grant EPA-T900591-03
See also PB-298 582 and PB-298 584.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Potable water, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The report describes potable water education/training programs which are currently being conducted in 19 states. In total, there are 41 program entries included in this volume. Criteria for selection was limited to the inclusion of at least three potable water courses as requirements for program completion. The programs presented herein include areas of emphasis such as: Hydrology, Aquatic Biology, Hydrogeology, Water Works Technology, Marine Environmental Sciences, and Coastal Oceanography.

PB-298 584/4GA PC **A03**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Wastewater Programs.
Final rept. on Phase 3.
Aug 79, 34p* EPA/600/8-79/023E
Grant EPA-T900591-03
See also PB-298 583 and PB-298 585.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Waste water, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The volume describes 28 post-secondary education/training programs which emphasize the environmental area of wastewater pollution control and abatement. The programs represent 16 states. Program areas of concentration include: water resources; wastewater pollution; plant operations and maintenance; environmental health; wastewater treatment and disposal; plant design; and, water chemistry.

PB-298 585/1GA PC **A03**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Radiation Programs.
Final rept. on Phase 3.
Aug 79, 40p* EPA/600/8-79/023F
Grant EPA-T900591-03
See also PB-298 584 and PB-298 586.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Radiation, Health phys-

ics, Radioactive wastes, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The report describes radiation education/training programs which are currently being conducted in 23 states and one territory. In total there are 39 program entries included in this volume. Although the report attempts to concentrate mainly on radiation protection programs, aspects of technologies, engineering, and public health are included. The criteria for selection of a program included at least three (preferably more) radiation courses required for program completion. Overall, the following types of programs were included: health physics; radiation health and safety; radiological health; nuclear or radiological waste management; and, radiological technician.

PB-298 586/9GA PC **A02**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Solid Waste Programs.
Final rept. on Phase 3.
Aug 79, 24p* EPA/600/8-79/023G
Grant EPA-T900591-03
See also PB-298 585 and PB-298 587.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Solid waste disposal, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

There are very few solid waste management programs currently being conducted in the United States. There are individual course offerings available at approximately 74 institutions. The criteria utilized for selection of an institution's program in the area of solid waste management were as follows: (a) a total program defined in the catalogue as such; (b) a dominant sequence, consisting of two or more courses; and, (c) a program which offered one to three courses as electives within the requirements. It became obvious that the environmental area of solid waste management did not lend itself to the same degree of categorization as other media areas. This may be attributed to the fact that solid waste management has not received the emphasis that, for example, air or water pollution control has received nationwide. In addition, there has been a sharp decrease in education/training monies allocated to this environmental area.

PB-298 587/7GA PC **A06**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Energy Programs.
Final rept. on Phase 3.
Aug 79, 106p* EPA/600/8-79/023H
Grant EPA-T900591-03
See also PB-298 586 and PB-298 588.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Specialized training, Schools, Engineering.
Identifiers: Curricula, Continuing education, Post secondary education.

The programs included in this volume are evidence that people are doing more than just talking about our energy future. In addition to well-established programs in nuclear engineering, mining, petroleum and natural gas technology and engineering, there are programs in energy conversion, energy engineering and policy, energy conversion and resources, energy resources management, and several others which represent recent innovative approaches to the broad spectrum of energy problems.

PB-298 588/5GA PC **A06**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Water/Wastewater Programs.
Final rept. on Phase 3.
Aug 79, 119p* EPA/600/8-79/023I
Grant EPA-T900591-03
See also PB-298 587 and PB-298 589.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Energy, Universities, Directories, Waste water, Water, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The volume of post-secondary education/training entries presents those programs which are classified as intersecting both environmental areas of potable water and wastewater. Programs categorized as applicable to either potable water or to waste-water, solely, will be found in those individual volumes of this report. This volume includes 183 water/wastewater programs which represent 46 states and one territory. In order for the program to have been included in this directory, the catalogue description must have listed at least three water and/or waste-water courses necessary for program completion.

PB-298 589/3GA PC **A06**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Composite: Environmental Engineering/Technology.
Final rept. on Phase 3.
Aug 79, 116p* EPA/600/8-79/023J
Grant EPA-T900591-03
See also PB-298 588 and PB-298 590.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Engineering, Universities, Directories, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

Beginning with Phase II of the National Environmental/Energy Workforce Assessment project, which addressed the capabilities of the educational community to generate an environmental workforce, definitional problems developed as to the placing of programs into media specific areas. While a great number of the programs could be categorized according to the traditional EPA media areas, other programs which were broader in scope, were not so easily allocated to these divisions. It became apparent that a broad-based category would have to be developed in order to include those programs which did not readily fit into any single category. Either these programs could be allocated to more than one media area. In order to include these unique and/or broad-based programs, a non-media specific category entitled COMPOSITE was created. Under the Phase II of the project two composite categories were defined and subsequently three volumes of educational/training program summaries were developed.

PB-298 590/1GA PC **A07**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Composite: Environmental Science/Health.
Final rept. on Phase 3.
Aug 79, 131p* EPA/600/8-79/023K
Grant EPA-T900591-03
See also PB-298 589 and PB-298 591.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, *Health, Universities, Directories, Solar energy, Water, Land use, Ecology, Environmental engineering, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

This volume includes the environmental health and science programs. In total, 205 programs representing 43 states, one territory and the District of Columbia are presented in this volume of environmental science/health programs. Areas of emphasis or program concentration included: marine and environmental sciences; solar energy; potable water supply; wastewater; land use; ecology; environmental biology; industrial hygiene; toxicology; radiation health; environmental management; environmental earth science; environmental and regional planning; environmental monitoring; and pollution prevention and control. It should be noted that often more than one of these concentrations or emphasis are applicable to one program.

PB-298 591/9GA PC **A10**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Composite: Environmental Studies.
Final rept. on Phase 3.
Aug 79, 202p* EPA/600/8-79/023L
Grant EPA-T900591-03
See also PB-298 590 and PB-298 592.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Environments, Universities, Directories, Specialized training, Schools.
Identifiers: Curricula, Continuing education, Post secondary education.

The volume encompasses the general programs. The major areas include environmental studies, environmental education, marine sciences and general environmental programs. The third of these volumes includes 336 programs and is the largest of all of the volumes.

PB-298 592/7GA PC **A12**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Environmental Employment in Public Service Jobs Programs: An Analysis of CETA Title VI FY 78 Projects.
Final rept. on Phase 3.
Aug 79, 258p* EPA/600/8-79/023M
Grant EPA-T900591-03
See also PB-298 591 and PB-298 593.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Education, *Specialized training, Environments, Employment, Salaries, Surveys, Unemployment, Unskilled workers.
Identifiers: Comprehensive Employment and Training Act of 1973.

This volume presents the findings of an analysis of 4,644 CETA Title VI projects for which 'environment' had been indicated as an appropriate public service area. Statistics regarding numbers employed in specific job categories, median salaries, variances in types of project agencies, and breakout information by type of project activity are included. The purpose of the analysis is to identify how CETA Title VI has been used in the past in accomplishment of environmental and energy related tasks. From this analysis it is possible to discern aspects of CETA which are conducive to implementation of superior projects and aspects of the law itself, or local practices which are not compatible with specific environmental and energy workforce needs and goals.

PB-298 593/5GA PC **A05**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Salaries and Attendant Problems of Public Sector Environmental Employment.
Final rept. on Phase 3.
Aug 79, 87p* EPA/600/8-79/023N
Grant EPA-T900591-03
See also PB-298 592 and PB-298 591.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Employment, *Government employees, Recruiting, Personnel selection, State government, Salaries, Fringe benefits.

The monograph deals with disparities between public and private sector employment conditions and practices which affect the recruitment and retention of personnel. The emphasis is on state agencies because the disparities are most evident at that level of public sector employment. Salary levels are, by far, the most tangible and effective differences; thus salary discrepancies and the consequences, thereof, are discussed in detail. Attendant issues which impact public sector employment are considered. Among these are opportunity for advancement, availability of training, educational leave, the merit system, public image, professional relationships, and meaningfulness of work.

PB-298 594/3GA PC **A07**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. The Role of CETA in Direct Training and Employment.
Final rept. on Phase 3.

Aug 79, 126p* EPA/600/8-79/0230
Grant EPA-T900591-03
See also PB-298 593 and PB-298 595.
Also available in set of 18 reports PC E99, PB-298 579-SET.

Descriptors: *Specialized training, *Legislation, Employment, Environments, Energy, Disadvantaged groups.

It is the basic intent of this monograph to explore the role of CETA in direct training and employment in the environment/energy fields. In addition, the impact of the 1978 Amendments will be examined with the former tenets of CETA. Included in this monograph are examples of CETA training and employment projects which have been conducted. Recommendations for future applications of CETA are discussed in the monograph's Commentary.

PB-298 595/0GA PC **A04**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Private Sector Training Activities.
Final rept. on Phase 3.
Aug 79, 75p* EPA/600/8-79/023P
Grant EPA-T900591-03
See also PB-298 594 and PB-298 596.
Also available in set of 18 reports PC E99, PB-298 579.

Descriptors: *Specialized training, *Industries, Environments, Energy, Universities, Schools, Education.
Identifiers: Post secondary education, Comprehensive Employment and Training Act of 1973, Curricula.

Under Phase III, materials from Phases I and II were analyzed and synthesized. Issues which were revealed to be of special importance to the future of the environmental/energy workforce, in terms of availability and quality, are being highlighted in a series of monographs, of which this is one. The monographs focus upon salient aspects of the NE/EWA findings in greater detail than possible in the formats of the previous phases.

PB-298 596/8GA PC **A06**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Problems in Environmental Education and Training.
Final rept. on Phase 3.
Aug 79, 123p* EPA/600/8-79/023Q
Grant EPA-T900591-03
See also PB-298 595 and PB-298 597.
Also available in set of 18 reports PC E99, PB-298 579.

Descriptors: *Education, *Environments, *Energy, Integration, Universities, Specialized training, Schools, Requirements.
Identifiers: Post secondary education, Continuing education.

This monograph presents in an integrated fashion, some of the representative problems and recommendations from the environmental post-secondary education/training sectors.

PB-298 597/6GA PC **A07**/MF **A01**
National Field Research Center, Inc., Iowa City, IA.
National Environmental/Energy Workforce Assessment. Workforce Planning Bibliography.
Final rept. on Phase 3.
Aug 79, 129p* EPA/600/8-79/023R
Grant EPA-T900591-03
See also PB-298 596.
Also available in set of 18 reports PC E99, PB-298 579.

Descriptors: *Education, *Environments, *Bibliographies, Universities, Manpower utilization, Specialized training, Schools, Requirements.
Identifiers: Labor force, Continuing education.

The material contained herein is an extensive listing of the significant literature in environmental workforce development. The bibliography is comprised of two separate sections, the first of which is an annotated listing of those materials which are thought to be among the most relevant to environmental workforce planners. The second section contains a listing of other materials also considered significant in workforce development.

PB-298 608/1GA PC **A02**/MF **A01**
Environmental Protection Agency, Washington, DC.
The Supply of Professional Environmental Manpower.
Report to the Congress,
J. Donald Cook. Aug 79, 20p EPA/600/8-79/025

Descriptors: *Professional personnel, *Environmental engineering, Education, Manpower, Specialized training, Requirements, Job analysis, National government, State government.

The report, which was directed by Congress, describes EPA's strategy for ensuring that there is an adequate supply of trained professionals to meet the environmental workforce needs in the U.S. The report describes EPA's mission and gives a historical perspective of graduate training support provided by EPA and its predecessor agencies. In describing EPA's priorities among various types of workforce development activities, the report cites conclusions reached in a 1977 study by the National Academy of Sciences on pollution control manpower and discusses factors affecting EPA support of academic training. One section discusses issues concerning academic training in toxic substances and related fields. EPA workforce activities proposed in the study include: assessing the environmental job market and publishing 5-year forecasts of the needs in the environmental field, examining the use of State-EPA agreements to encourage professional workforce planning; determining shortages of trained professionals in toxicology and related fields; supporting university centers of excellence in the research fields of epidemiology, ground water protection, and advanced waste treatment techniques; establishing area training centers at selected educational institutions; testing combining selected research and training activities at a single location; establishing priorities among workforce development activities; and encouraging State sufficiency in environmental programs.

PB-298 677/6GA PC **A09**/MF **A01**
Michigan Univ., Ann Arbor.
Preemployment Strength Testing in Selecting Workers for Materials Handling Jobs,
Don B. Chaffin, Gary D. Herrin, W. Monroe Keyserling, and James A. Foulke. May 77, 190p
DHEW/PUB/NIOSH-77/163
Contract CDC-99-74-62

Descriptors: *Strength, *Job analysis, *Materials handling, *Performance evaluation, Musculoskeletal system, Evaluation, Data collection, Personnel, Stress(Physiology), Assessments, Recommendations.
Identifiers: *Occupational safety and health.

Over 900 jobs in six factories were evaluated to determine the cause of musculoskeletal problems. A medical history and physical activity history were taken and a physical examination administered as well as isometric strength tests. Workers on the study jobs and their supervisors were queried about the apparent physical ability of the workers to perform the job. Data was collected over a one and one-half year period. It was found that; frequent lifting of heavy loads is associated with increased incidence and severity of musculoskeletal problems, weaker workers have an increased incidence and severity of musculoskeletal and contact type injuries, strength is not well predicted by gender, age, body weight, or stature, strength can be assessed by testing a worker in postures that are standardized or that reflect the maximum load related postures required on the job. New biomedical and metabolic job evaluation methods were used to demonstrate how re-engineering could reduce the potential for musculoskeletal injuries. This action level should prevent the adverse effects of load magnitude, handling frequency, size, and location on a job. If the action level is exceeded then a medical examination with strength assessment would be required for all workers on such jobs. The action level would also require a biomechanical evaluation of the job to determine if engineering redesign could reduce the hazard levels.

PB-298 781/6GA PC **A02**/MF **A01**
General Accounting Office, Washington, DC. Financial and General Management Studies Div.
Federal Civilian Audit Organizations Have Often Been Unsuccessful in Obtaining Additional Staff.
Report to the Congress.
27 Jul 79, 21p FGMSD-79-43

Descriptors: *National government, *Auditing, *Manpower, Administrative support, Accounting, Records management, Manpower utilization, Requirements, Shortages, Resource allocation, Budgeting, Appropriations, Personnel selection.
Identifiers: Agencies, Organization size(Groups).

The problems disclosed in a 1976 GAO report that were associated with obtaining sufficient audit staff in Government agencies persist today. In the past 5 years, agency audit organizations frequently have been unsuccessful in obtaining additional staff. This situation is hampering the efforts of two Offices of Inspector General in their reviews of fraud and abuse in Government and will create problems for other Inspector General offices established recently. The Office of Management and Budget should develop guidelines to assist Federal agency management in determining the appropriateness of the size of their audit staffs. Also, the Congress should inquire about the adequacy and effectiveness of Federal internal audit staffs at agency oversight and appropriations hearings.

PB-298 937/4GA PC **A04**/MF **A01**
Port Authority of New York and New Jersey.
Staggered Work Hours Study. Design and Implementation of Staggered Work Hours in Manhattan. Volume I - Executive Summary.
Final rept. on Phase 1.
Aug 77, 73p UMTA-IT-09-0023-79-1
See also Volume 2, PB-298 938. Also pub. as Tri-State Regional Planning Commission, New York, Rept. no. TS-A520.
Also available in set of 3 reports PC E10, PB-298 936-SET.

Descriptors: *Scheduling, *Employment, Transportation, Flexibility, Personnel management, Urban areas, Traffic.

The concept of staggered work hours is a proven 'low capital-intensive' method of reducing transportation congestion. Experience has shown that the staggered work hours program in Manhattan has not only reduced congestion on transportation systems, but has improved efficiency in business operations by reducing lobby congestion and improved employee attendance, punctuality and morale, all of which are additional non-cost benefits. The objective of this study was not only to further the staggered work hours program in the New York-New Jersey region, but also to determine means and methods to assist other communities in establishing their own staggered work hours program. This report, Volume I, provides a concise description of the work conducted during the study and includes the principle findings, a comparison of staggered work hours, flexible work hours, the four-day work week, and highlights the state-of-the-art of staggered work hours programs in the United States and abroad, based on a comprehensive survey of more than 200 cities throughout the world.

PB-298 938/2GA PC **A18**/MF **A01**
Port Authority of New York and New Jersey.
Staggered Work Hours Study. Design and Implementation of Staggered Work Hours in Manhattan. Volume II - Technical Report.
Final rept. on Phase 1.
Aug 77, 415p UMTA-IT-09-0023-79-2
See also Volume 1, PB-298 937 and Volume 3, PB-298 939. Also pub. as Tri-State Regional Planning Commission, New York, Rept. no. TS-A520.
Also available in set of 3 reports PC E10, PB-298 936-SET.

Descriptors: *Scheduling, *Employment, Transportation, Flexibility, Personnel management, Urban areas, Traffic.

The report, Volume II, consists of ten chapters which discuss in detail, broad categories such as the state-of-the-art survey, criteria for staggered work hours, work schedule surveys, design and implementation procedures for a successful program, transportation surveys and analysis, attitude surveys, and an evaluation of three different work schedule concepts -- staggered work hours, flexi-

ble work hours, and the four-day workweek. Each chapter follows the same pattern of four major sections: objectives; work performed; analysis; and recommendations.

PB-298 939/0GA PC **A03**/MF **A01**
Port Authority of New York and New Jersey.
Staggered Work Hours Study. Design and Implementation of Staggered Work Hours in Manhattan. Volume III - Staggered Work Hours Manual.
Final rept. on Phase 1.
Aug 77, 34p UMTA-IT-09-0023-79-3
See also Volume 2, PB-298 938. Also pub. as Tri-State Regional Planning Commission, New York, Rept. no. TS-A520.
Also available in set of 3 reports PC E10, PB-298 936-SET.

Descriptors: *Scheduling, *Employment, Transportation, Flexibility, Personnel management, Urban areas, Traffic.

The report, Volume III, is intended to present an overall methodology for designing, implementing, and evaluating a staggered work hours program in an urban area. This volume is organized to cover the most important considerations involved in setting up a program in order to provide decision makers with the guidelines and tools necessary to first identify the need for a program, and then to promote, implement, and evaluate it.

5J. Psychology (Individual and Group Behavior)

AD-A070 524/4GA PC **A04**/MF **A01**
Integrated Sciences Corp Santa Monica CA
An Investigation of Selected Alternative Decison Aids.
Technical rept.,
David H. Walsh, and Michael D. Schechterman.
Apr 79, 52p Rept no. ISC-215-5
Contract N00014-75-C-0811

Descriptors: *Decision making, *Interactive graphics, Command and control systems, Man computer interface, Nonlinear programming, Mission profiles, Naval planning, Tactical analyses, Computer architecture, Computer programs.

This is a report of work accomplished on one task in the project entitled, Operational Decision Aids (ODA), which was initiated in 1974 by the Office of Naval Research to develop aids for Navy command and control functions and make them available for incorporation in the design of future systems. The decision aids developed by ONR contractors under the ODA program make heavy use of interactive graphics. It was felt that knowledge about other military use of interactive graphics would enable us to evaluate and improve upon our own techniques as we are developing them. Therefore the authors looked for and found three decision aids that are being developed under sponsorship of agencies other than ONR and that have the following characteristics: The solution process performed by the system consisting of an operator, hardware, and software considers many interacting variables; The operator's role is to structure the problem and/or guide the process through multiple steps to a solution satisfactory to him; The system uses interactive graphics to represent the problem and to display potential solutions; and The problem is dynamic and the system helps the operator to consider problem dynamics. The report describes these three aids.

AD-A070 547/5GA PC **A02**/MF **A01**
Naval Health Research Center San Diego CA
A Search for Bias in Evaluating Job Performance in Rehabilitated Alcoholics.
Final rept.,
Darrel Edwards, Pat Coben, Susan Finchman, Newell H. Berry, and Steven F. Bucky. Jan 76, 13p Rept no. NAVHLTHRSCHC-76-12

Descriptors: Performance(Human), Job analysis, *Bias, Rehabilitation, Alcoholism, Work measurement, *Naval personnel, Physical fitness, Therapy, Ratings.
Identifiers: Alcoholics.

This study evaluated the bias associated with one rehabilitation program. Specifically, judgment of work performance by commanding officers of Navy men returned to duty after treatment at an Alcoholic Rehabilitation Unit (ARU). Bias was not present in the judgment of commanding officers on men returned to duty from an alcoholic rehabilitation program in the Navy.

AD-A070 748/9GA PC **A03**/MF **A01**
Navy Personnel Research and Development Center San Diego CA
Discriminating between Failures and Graduates in a Computer-Managed Course using Measures of Cognitive Styles, Abilities, and Aptitudes.
Interim pret. May 77-Apr 78,
Pat-Anthony Federico, and David B. Landis. Jun 79, 37p Rept no. NPRDC-TR 79-21

Descriptors: *Perception(Psychology), Computer aided instruction, *Performance(Human), Tables(Data), Skills, Schools, Students, Mental ability, Behavior, Education, Comparison.

Measures of cognitive styles, abilities, and aptitudes were obtained for a sample of BE/E School graduates and failures, and used to perform discriminant analyses to determine which linear combination of measures could optimally differentiate the two groups. Classification functions obtained for derived discriminate functions were applied to measures of cognitive characteristics obtained for the study participants to evaluate the effectiveness of the discriminations in predicting group membership (i.e., BE/E graduates or failures). Results showed that the two groups differ significantly in certain cognitive characteristics, and that the classification functions were valid predictors of BE/E success or failure. (Author)

AD-A070 789/3GA PC **A06**/MF **A01**
Baruch Coll New York
Evoked Cortical Potentials and Information Processing.
Annual rept. no. 6, 1 Jan 78-30 Jun 79,
John L. Andreassi, Joseph A. Gallichio, and Nancy E. Young. 30 Jun 79, 104p
Contract N00014-77-C-0114

Descriptors: *Information processing, Visual perception, Psychophysiology, Velocity.
Identifiers: ERP(Event Related Potential).

In summary, the present findings show that there are perceptual differences between continuous and apparent motion and that these differences may be reflected in the latency and amplitude of the VEP. Furthermore, theoretical and cell system models were presented to account for the observed differences. These models propose that continuous motion is processed by specialized motion detecting cells which may respond to velocity as an intensity factor in motion. In apparent motion, the models suggest that cells would respond to the spatial and temporal change in position over time aspects of this type of motion and the role of velocity as an intensity factor would be diminished. Thus, it is suggested that future studies be undertaken to compare continuous and apparent motion using a wider range of velocity conditions and recording locations. Also, the direction of motion should be systematically examined for both continuous and apparent motion.

AD-A070 804/0GA PC **A02**/MF **A01**
Naval Air Development Center Warminster PA Aircraft and Crew Systems Technology Directorate
Urinary Molecular Determinants for the Prediction of Ischemic Anoxic Stress Pathology: Evaluation of Lipid Peroxides, Phenolic Acids and Generated Free Radical Compounds as Bioindicators of Stress.
Phase rept.,
Herman W. Shmukler, B. David Polis, and Elaine Soffer. 15 May 79, 20p Rept no. NADC-79084-60

Descriptors: *Stress(Physiology), *Stress(Psychology), Urine, Collection, Acids, Free radicals, Coronary disease, Pathology, Test methods, Tables(Data).
Identifiers: *Lipid peroxide, Phenolic acid.

In preliminary studies in which a small number of test subjects were used, the 24-hr urinary excretion of phenolic acids, lipid peroxides and generated free radicals when plotted in a three-dimensional manner appeared to be a bioindicator of the effects of pathological stress. This methodology was tested with larger populations of control, acceleration stressed, and coronary artery diseased subjects to obtain statistically reliable data. Results showed large individual variations in excretion of three parameters within each test group, as well as for individual subjects tested on different days. Consequently, overlapping of calculated mean values and standard error of the means, for the test groups, invalidates use of GFR-lipid peroxide-phenolic acid three-dimensional plot as a noninvasive bioindicator of stress. (Author)

AD-A070 820/6GA PC **A03**/MF **A01**
Naval Health Research Center San Diego CA
A Case for Psychiatric Diagnosis.
Final rept.,
J. Susan Fichman, and Darrel Edwards. Dec 74, 32p Rept no. NAVHLTHRSCHC-75-10

Descriptors: *Diagnosis(Medicine), *Psychiatry, Clinical medicine, Adjustment(Psychology), Patients, Statistical analysis, Ratings, Consistency, Judgement(Psychology).
Identifiers: Psychiatrists.

Psychiatric diagnosis has been severely criticized by many clinicians and researchers. Studies in clinical judgment and diagnosis leading to this criticism were reviewed. Research designs were evaluated in terms of their relevance to diagnosis. Most projects were extremely narrow in scope and it was inappropriate to apply their conclusions to the process of diagnosis. Research evaluating diagnosis in real clinical settings showed that diagnosis accurately and consistently assessed the patents' capacity for successful post-hospitalization readjustment. In an effort to evaluate diagnosis as practiced in the clinical setting, the grid method was used. Psychiatrists rated patients from their practice, generating their own dimensions for comparison. Patients within a diagnostic category were consistently evaluated as being more similar to each other than patients from different diagnostic categories. The use of this highly individual technique assured that even analysis of grouped data would not obscure the basic strength of the diagnostic process. (Author)

AD-A070 829/7GA PC **A03**/MF **A01**
Naval Health Research Center San Diego CA
An Attempted Validation Study of the Birthdate Based Biorhythm (BBB) Hypothesis.
Interim rept.,
C. E. Englund, and P. Naitoh. Dec 77, 29p Rept no. NAVHLTHRSCHC-77-52

Descriptors: *Performance(Human), Predictions, Biological rhythms, Hypotheses, Naval research, Birth, Test and evaluation, Students, Performance tests.
Identifiers: BBB(Birthdate Based Biorhythm).

The birthdate-based biorhythm (BBB) hypothesis was examined for utility as a predictor of human performance. Data from quizes of 26 students taken periodically throughout a semester, and measures over one month of landing performance for seven pilots were analyzed by multiple regression/correlation methods. Regression equations were developed to test the correspondence between performance and cycle phases. A second analysis used a non-orthogonal least-square spectrum method to determine if the data contained any systematic rhythms in the infradian range. No significant results were obtained which would support the BBB hypothesis as a predictor of human performance. Also no evidence was found to substantiate the existence of the three proposed BBB cycles. (Author)

AD-A070 910/5GA PC **A04**/MF **A01**
Wichita State Univ KS Center for Human Appraisal
Communication Channel Utilization: An Examination of one of the Superordinate-Subordinate Relationships.
Interim rept.,
Ambrose Vaughn. May 74, 71p TR-120, AFOSR-TR-79-0819
Grant AFOSR-71-2001

Descriptors: *Interpersonal relations, *Social communication, Personality, Roles(Behavior), Leadership, Correlation techniques, Job satisfaction.
Identifiers: Authoritarianism, Interpersonal communication, Superordinate subordinate relationships.

The author studied communication channels as they related to superior subordinate roles as defined by Sweney's 'Response to Power Model'. He found permissives spent more time using informal channels of talking and listening, but more time writing to equals than the other two roles. Authoritarians spent more time speaking to superordinates and less time listening to equals; equalitarians spent more time reading and less time listening to equals. Critics spent less talking or listening to equals; rebels spent less time talking or listening to equals; and the ingratiators spent more time listening and speaking to superordinates and less time reading from either equals or subordinates. When the subordinate was a rebel, the superordinate spent more time listening. When the subordinate was a critic, the superordinate spent more time speaking and less time listening to him and more time listening to his own boss. When the subordinate was an ingratiator, the boss spent less time listening. When the boss was authoritarian, the subordinate spent more time talking to him and less time talking to equals. When the boss was permissive, the subordinate spent less time writing to equals but more time listening to them. From the correlation matrix, it was found that the individual had greater satisfaction when he was communicating with superordinates or subordinates and less satisfaction when he was communicating with peers. (Author)

AD-A070 911/3GA PC **A03**/MF **A01**
Wichita State Univ KS Center for Human Appraisal
The Role Reaction Model and Some Confirming Evidence.
Interim rept.,
Arthur B. Sweney, and Leslie A. Fiechtner. May 76, 40p TR-121, AFOSR-TR-79-0817
Grant AFOSR-71-2001

Descriptors: *Interpersonal relations, Leadership, Behavior, Reaction(Psychology), Power, Conflict, Models, Roles(Behavior), Perception(Psychology), Motivation, Guided missile personnel, Supervisors.
Identifiers: Authoritarianism.

A model is presented to succeed the 'Response to Power Model'. It posits the existence of two distinctly different components for each of the four manipulative roles; authoritarianism, permissiveness, rebelliousness, and ingratiation. The interactive component results from direct positive reenforcement of existing behavior, representing an effort to effect harmony. The counteractive components result from conflicts in needs and are directed toward efforts to force a change in the partner's behavior. The similarity in overt behaviors and differences in purpose of these two components has done much to confuse the leadership field. This model reconciles the paradox of the opposing viewpoints of behavior modification and humanism. This shows how both dynamics are operating simultaneously. Research results are reported to support the hypotheses presented by the model. Directly induced role changes in the other dyad member are still only minimal. There is very strong confirmation, however, for the actor's acquisition roles which are related to his perception of the target person. In all areas, these fit the hypotheses posed by the model.

AD-A070 964/2GA PC **A05**/MF **A01**
Boeing Aerospace Co Seattle WA
Cyclophoria and Pilot Prediction of the Runway Plane.
Final rept. Mar-Dec 78,
Conrad L. Kraft, Charles D. Anderson, Helen von Tobel, and Jeffrey D. Kosan. Feb 79, 99p
AFOSR-TR-79-0830
Contract F49620-78-C-0052

Descriptors: *Perception(Psychology), *Vision, Pilots, Air Force personnel, Patterns, Runways, Approach, Predictions.
Identifiers: *Cyclophoria, Cyclorotation, Cyclotorsion.

This investigation had two primary objectives: (1) to determine the direction and magnitude of cyclophoria resting states in a sample of observers taken from a select population (AF pilots); (2) to determine whether the magnitude of cyclophoria found had the potential of affecting the pilots' perception of the runway plane on final approach. The Circle/Bar test was administered to 12 pilots under 0, 5 and 10 degrees of instrument convergence. The increases in Convergence significantly increased the measured cyclophoria from .01 degrees encyclophoric to .65 and .82 degrees excyclophoric. A second, previously developed, test (the ARC test) was used to measure cyclophoria under conditions of a more complex and structured image than the Circle/Bar test. The ARC test was given with zero and + or - two degrees of image cyclorotation, which corresponded to + or - 114 arc seconds of induced disparity into the ARC test. Image cyclorotation produced significant effects in responses on the ARC test, with observed shifts, in the expected direction from the nonrotated condition of 13.5 and 13.6 arc seconds for two degrees excyclorotation and encyclorotation respectively. The magnitude of this shift is only about 12 percent of the induced disparity, a reflection of the interaction of the complex stimulus pattern.

AD-A070 968/3GA PC **A04**/MF **A01**
Wichita State Univ KS Center for Human Appraisal
The Measurements of Job Stress on an Operational Unit of the Military.
Interim rept.,
Nazaire C. LeBlanc. Mar 77, 62p TR-77-117, AFOSR-TR-79-0818
Grant AFOSR-76-2907

Descriptors: *Jobs, *Stress(Psychology), Air Force operations, Military police, Security personnel, Maintenance personnel, Guided missile personnel.

A study was performed to measure the amount of job stress that was present in various jobs in an operational unit of the U. S. Air Force. The job areas that were measured were the Personnel field (CBPO), Missile Operations, Maintenance, Security Police, and members of the Communications Squadron. It was assumed that these jobs were representative of the jobs needed to accomplish the mission of an operational unit. Essential to this study was an analysis of the differences in job stress perceptions by commanders and their subordinates. An understanding of this difference can go far toward alleviating stress in jobs and in increasing the performance of the individuals holding those jobs. A further analysis was made into analyzing specific areas of stress and comparing them to areas of threat measured by other testing instruments. These other instruments were covert means of measuring stress in terms of fear and anxiety.

AD-A070 970/9GA PC **A03**/MF **A01**
Illinois Univ at Urbana-Champaign Engineering-Psychology Lab
Attention Allocation in Dynamic Environments.
Interim rept.,
Christopher D. Wickens, and Pamela S. Tsang. Jun 79, 30p EPL-79-3/AFOSR-79-3, AFOSR-TR-79-0765
Grant AFOSR-77-3380

Descriptors: *Human resources, *Resource management, *Attention, Performance(Human), Allocations, Behavior, Transfer functions, Motivation.

Three policies of attention resource allocation between tasks of dynamically varying difficulty are described. These policies--optimal allocation, optimal resource expansion, and non-optimal allocation are distinguished analytically by the gain of the transfer function between task difficulty and primary and secondary task performance. Eight subjects' time-shared two compensatory tracking tasks in which the control dynamics of the primary task fluctuated continuously between first and second order. Linear control analysis of the difficulty and filtered RMS error performance measures indicated that subjects were initially non-optimal in their allocation policy, failing to guard the primary task in the face of fluctuations in its difficulty. With practice, a trend toward more optimal performance was observed. This appeared to be related to greater automation of performance at the most difficult level. However, close anlaysis and comparison of the variable difficulty data with performance in constant difficulty dual task conditions indicated a persisting limitation in subjects' ability to reallocate resources from the secondary task when required by demand changes of the primary.

AD-A071 027/7GA PC **A02**/MF **A01**
California Univ San Diego La Jolla Center for Human Information Processing
Studies of Learning and Self-Contained Educational Systems, 1976-1979.
Final rept. 1 Feb 76-31 Jan 79,
Donald A. Norman. Jun 79, 21p Rept no. 7902
Contract N00014-76-C-0628

Descriptors: *Learning, Retention(Psychology), Computer aided instruction, Education, Man computer interface, Instructional materials, Computers, Teaching machines.

This project examines the learning of complex topics. The research was aimed at two different aspects of the study of learning and instruction: (1) theoretical understanding of what is going on the learner's mind; (2) development of intelligence interactive computer-based instructional systems. Two computer-based tutorial systems, Coach and Instruct, were developed. The findings of our research are summarized. (Author)

AD-A071 079/8GA PC **A08**/MF **A01**
Naval Postgraduate School Monterey CA
Job Enrichment in Antisubmarine Warfare.
Master's thesis,
Robert Emmett DeLateur. Jun 79, 173p

Descriptors: *Job satisfaction, *Naval personnel, *Antisubmarine warfare, Motivation, Operators(Personnel), Behavior, Job analysis, Morale, Performance(Human), Theses.

Since the all volunteer force came into being, retention of military personnel beyond their first enlistment has become an increasingly important problem, especially for the U.S. Navy. Yearly retention conferences have been held for the purpose of developing plans to reduce turnover. The results of the latest conference brought the focus of attention to better leadership and management training of U.S. Navy personnel. Among the techniques that deals with the problems of absenteeism and turnover is job enrichment. The main thrust of job enrichment is to increase retention by increasing work satisfaction. Job enrichment as a management technique focuses on the basics of employee motivation and work behaviors. It aids the managers in identifying the components which comprise a job, and enables them to determine satisfying components that can be enhanced and dissatisfying components that can be diminished or eliminated.

AD-A071 086/3GA PC **A03**/MF **A01**
Army Research Inst for the Behavioral and Social Sciences Alexandria VA
Using an Assessment Center to Predict Field Leadership Performance of Army Officers and NCOs.
Technical paper Jul 73-Dec 74,
Frederick N. Dyer, and Richard E. Hilligoss. May 79, 39p Rept no. ARI-TP-372

Descriptors: *Leadership, Performance(Human), Officer personnel, Army personnel, Predictions.

During 1973 and 1974, the U.S. Army Infantry School (USAIS) Assessment Center (ACTR) at Fort Benning, GA., tested 408 officers and NCOs who were students in USAIS leadership courses. Field leadership performance ratings for these assessees were then obtained at 6- and 18-month intervals following graduation and assignment to new units. Complete rating data was obtained at 6 months for 159 of the original assessees and at 6 and 18 months for 108 of these assessees. Correlations between these ratings at 6 and 18 months averaged .66 for the different assessee groups, indicating a substantial degree of reliability for the rating instrumeni. Field leadership performance at 6 months was predicted by items in entry interview, a paper and pencil test, and a Person Description Blank. Taken together, however, the results indicate only marginal utility for the USAIS ACTR for prediction of the field leadership performance of junior officers and NCOs. Typically, the more assessor time required for an assessee measure, the less chance that the score would predict field leadership. (Author)

AD-A071 115/0GA PC **A05**/MF **A01**
Human Resources Research Organization Alexandria VA
A Review of Selected Literature on Stresses Affecting Soldiers in Combat.
Technical rept. 11 May 77-11 May 78,

Albert L. Kubala, and William L. Warnick. May 79, 86p HUMRRO-FR-WD-TX-78-6, ARI-TR-79-A14 Contract DAHC19-75-C-0025

Descriptors: *Stress(Psychology), *Stress(Physiology), *Performance(Human), Literature surveys, Warfare.

This report reviews selected literature on psychological and physiological stressors which affect the soldier in combat. The selections were oriented toward: (a) documents which describe the types of stressors which are likely to be encountered on the battlefield, and (b) documents which describe performance during or following stressful experiences. (Author)

AD-A071 116/8GA PC **A03**/MF **A01**
Human Resources Research Organization Alexandria VA
A Further Look at the Prediction of Weapons Effectiveness in Suppressive Fire.
Technical rept. 11 May 77-11 May 78,
Albert L. Kubala, and William L. Warnick. May 79, 50p HUMRRO-FR-WD-TX-78-4, ARI-TR-79-A19 Contract DAHC19-75-C-0025

Descriptors: *Behavior, *Perception(Psychology), *Small arms ammunition, Combat effectiveness, Projectiles, Predictions, Suppression.

This research and literature review investigated the relationship between acoustic signatures of small-arms projectiles and the suppressive behavior which results from soldiers' perceptions of danger. Kinetic energy, which is associated with perceived loudness of passing projectiles, appears to be the primary physical property of projectiles that affects behavior under fire. The report is written for military personnel. (Author)

AD-A071 117/6GA PC **A04**/MF **A01**
Georgia Inst of Tech Atlanta School of Information and Computer Science
Selecting and Representing Information Structures for Battlefield Decision Systems.
Final rept. Sep 77-Jun 78,
Albert N. Badre. Jun 79, 60p ARI-TR-79-A20
Grant DAHC19-77-G-0022

Descriptors: *Decision making, Battlefields, Information systems, Information processing, Selection, Display systems, Perception(Psychology).

The objective of this research was to identify and apply experimental techniques for locating and evaluating data patterns and informational 'chunks' which are meaningful to the battlefield commander in his decision-making tasks. The identification of meaningful chunks of information is useful in specifying criteria for the development of decision-aiding algorithms that search for, classify, and display information. Two main tasks were used for collecting data about informational chunks: reconstruction and copying. In the reconstruction task an experimental run consisted of a successive number of trails. In each trial the participant first viewed a battlefield map scenario for either ten seconds or one minute; then it was removed and he was asked to reconstruct it. In general, the experts' performance was superior to that of the novices on accuracy of reconstruction both for structured scenarios representing likely battlefield situations and unstructured scenarios representing situations unlikely to occur on a real battlefield. Both the IPT and sequential techniques revealed that the experts' chunks were tactically meaningful with high frequency, while the novices' chunks were not. The basic element of a chunk for the expert was the tactical relation between two or more battlefield units rather than the battlefield unit itself. However, even the novice chunked by relating symbols in some meaningful way.

AD-A071 125/9GA PC **A02**/MF **A01**
Naval Health Research Center San Diego CA
Psychiatric Intervention after Retirement for Young Men.
Final rept.,
Darrel Edwards, Susan Fichman, Newell H. Berry, and Judith Hardy. May 76, 11p Rept no. NAVHLTHRSCHC-76-34

Descriptors: *Retirement(Personnel), Psychiatry, Alcoholism, Diagnosis(Medicine), Stress(Psychology), Youth, Males, Clinical medicine, *Adjustment(Psychology).

The evidence suggest that retirement from the military may pose a psychiatric problem for some, even before the actual retirement commences. The effects of these troubles on functioning in retirement are important ones and health care facilities with any institutional relationship to a retired population might attend to the parameters affecting incidence and prevalence of problems in that population. These institutions might expect increased psychiatric caseloads and prepare for work with depression, alcoholism and schizophrenia. Factors which facilitate transition to the retired role with minimal difficulties are clearly defined. (Author)

AD-A071 126/7GA PC **A02**/MF **A01**
Naval Health Research Center San Diego CA
A Model for Measuring the Consistency of Diagnostic Classification.
Final rept.,
Susan Fichman, and Darrel Edwards. Jul 76, 15p Rept no. NAVHLTHRSCHC-76-47

Descriptors: *Psychiatry, *Diagnosis(Medicine), Therapy, Models, Quality, Test and evaluation, Methodology.

Appearance of this material in the professional literature is in support of the Chief of Naval Material's program for Military-Civilian Technology Transfer and Cooperative Development. Psychiatric screening, evaluations, and treatment strategies represent 300,000 manhours lost to the Navy each year. With this heavy responsibility, there is a great need for good methods to promote uniform quality practices in diagnosis and treatment. The model presented can be used to assure high quality screening, evaluation, and treatment in the naval psychiatric environment. Evaluation of clinical training is a complex task. Traditional methods have relied on directly observable criteria and often produced good decision making procedures. This paper presents a methodology for examining the conceptual process of diagnosis. Thirteen psychiatrists evaluated their own patients using a grid method. Each doctor's grid was examined individually using cluster analysis. The Doctor's cluster structures were evaluated to determine whether the psychiatrists were systematically using diagnosis to classify the patients. Application of this technique to the training setting was presented. (Author)

AD-A071 127/5GA PC **A02**/MF **A01**
Naval Health Research Center San Diego CA
Marine Corps Outpatients: A Dilemma for Navy Psychiatry.
Final rept.,
Darrel Edwards, Newell H. Berry, Judith Hardy, and Susan Fichman. Aug 76, 11p Rept no. NAVHLTHRSCHC-76-49

Descriptors: *Psychiatry, Marine Corps personnel, *Outpatient Clinics, Statistical data.

In a period in which service strengths may be difficult to maintain, careful consideration might be given to keeping career oriented men in the service who have demonstrated the ability to perform effectively. A sample of 862 enlisted Marines sent to outpatient psychiatrists for consultation were studied to determine which men could continue to serve effectively. The outcome data revealed that those men who had been returned to duty and had completed their enlistment were successful only 7% of the time. Only 3% of the men who had been discharged for any reason were considered successful -- were able to reenlist. Fourteen percent of the men returned to duty were still at duty two years later and were considered as occupationally effective. The extremely high ineffectiveness rate raises questions out the Marine Corps policies which may lead to a high rate of loss of men who could continue a career in the Marine Corps. (Author)

AD-A071 128/3GA PC **A02**/MF **A01**
Naval Health Research Center San Diego CA
Children in Therapy as a Signal for Help for Parents.
Final rept.,
Darreli Edwards, Susan Fichman, and Newell H. Berry. Oct 76, 11p Rept no. NAVHLTHRSCHC-76-64

Descriptors: *Psychiatry, *Stress(Psychology), Therapy, *Children, Marriage, Naval research. Identifiers: Parents, Military families.

Appearance of this material in the professional literature is in support of the Chief of Naval Material's program for Military-Civilian Technology Transfer and Cooperative Development. Military families experience stresses which result in a child being identified as a problem and taken to the doctor. Navy psychiatrists and the service families would benefit from guildelines to effective intervention. This study defined some of those guidelines. A sample of 114 children in 18 outpatient psychiatric clinics were studied over a one year period. Demographic data on the parents and the child, a behavioral complaint check list, and psychiatric decisions were collected in each case. The characteristics of the case which might lead to diagnosis and treatment strategies were examined. A number of characteristics of the case were related to treatment decisions: (1) very young children were usually not diagnosed as needing help, (2) young, educated mothers were more likely to bring a child to a clinic without the need for treatment for the child, (3) having the father return after a long absence often resulted in a child being brought for treatment, and (4) generally, children who are taken to a psychiatric clinic and who are diagnosed are signals that parental or conjugal problems are present. If parents are treated, treatment is completed. If the child is treated, treatment is likely to be terminated prematurely by the parents. (Author)

AD-A071 182/0GA PC **A03**/MF **A01**
Army Research Inst for the Behavioral and Social Sciences Alexandria VA
The Role of Presupposed and Focal Information in Integrating Sentences.
Technical paper,
Frank R. Yekovich, Carol H. Walker, and Harold S. Blackman. May 79, 32p Rept no. ARI-TP-364

Descriptors: *Psycholinguistics, Reading, Comprehension, Instructional materials, Intelligibility, Test construction(Psychology).
Identifiers: Sentences, Anaphora.

Two experiments explored the linguistic processes that underlie integration of the meaning of one sentence with the meaning of another. The authors propose that the linguistic markings of both a referring anaphor and the antecedent to which it refers are important for comprehension. The integrating process involves identifying a primary antecedent from a context sentence and relating an approxiately marked anaphor from the target sentence back to the antecedent. The primary antecedent is ideally marked as focal (new information) in the context sentence, whereas the anaphor is linguistically presupposed (old information) in the target sentence. Two comprehensive-time experiments tested this idea. Subjects read sentence pairs in which the linguistic markings of a repeated noun phrase varied across the sentences. Context sentences incorporated the noun phrase as either presupposed (P) or focal (F), and the target repetition appeared as either presupposed (P) or focal (F). Comprehension time was fastest for FP combinations, intermediate for FF and PP pairs, and slowest for PF combinations. These results obtained when the proximity of the repeated phrase was controlled (Experiment I) and also when target sentences were in both active and passive voices (Experiment II). This report is intended for psychologists interested in linguistics. (Author)

ED-163 905 Not available NTIS
Relationships of Selected Perceptual Variables to Leveling/Sharpening in the Memory of Sequential Visual Images.
Lynna J. Ausburn, and Floyd B. Ausburn. Apr 78, 11p
Paper presented at the Annual Meeting of the Association for Educational Communications and Technology, Kansas City, MO. April 1978.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$1.67, MF$0.83 Plus Postage.

Descriptors: Educational research, Memory, Perception tests, *Recall(Psychological), Retention studies, Sequential learning, *Visualization, Visual measures, *Visual perception.

This study was designed to examine relationships between three variables of analysis/integration

skill in visual perception and the tendency to retain differentiated memories of sequential visual images in a sample of 206 university undergraduates. Correlation techniques and factor analysis were used to analyze relationships between the perceptual variables and the memory variable. While some relationships between perceptual skill and memory were found which were statistically significant, variations in neither individual perceptual skills nor in factors which they formed in combination were found to account for a sufficient portion of variance in visual memory functioning to be of practical importance. Leveling/sharpening in visual memory appeared to be largely independent of the specific perceptual skills measured in this study.

HRP-0028328/3GA Not Available NTIS
Georgetown Univ., Washington, DC. Kennedy Center for Bioethics.
Some Neglected Aspects of Moral Responsibility for Health.
Richard A. McCormick. 1978, 13p
Pub. in Perspectives in Biology and Medicine v22 n1 p31-43 1978.

Descriptors: Communities, Demography, Guidelines, *Health care, Health planning, Methodology, *Policies, Socioeconomic status, Sociology.

This essay addresses a number of neglected aspects of responsibility for health. The term 'health', it is argued, is both too broad and too narrow to convey our responsibilities. It is too broad in the World Health Organization definition of health as 'a state of complete physical, mental and social well-being'. On the other hand, it is too narrow if moral responsibilities to the dying are forgotten. We also forget that health is deeply affected by the lifestyle of a culture or nation which in turn embodies certain value priorities. Moral responsibility for health entails keeping a sharp eye on the harmonization of public concerns with the needs of individuals. It entails sensitivity to difficult quality-of-life judgments, e.g., judgments about instigation or withdrawal of treatment for defective newborns. Prevention, cure, and care, it is believed, should be extensions of genuine human caring and love, involving the total person. Responsibility must be holistic, encompassing all those things which affect life and health.

PB-298 406/0GA PC **A03**/MF **A01**
Office of Personnel Management, Washington, DC. Personnel Research and Development Center.
An Analysis of Criterion-Related Validity Evidence Relevant to Test 650.
Final rept.,
Kenneth Pearlman, and Lois Northrop. Dec 78, 29p TM-78/7

Descriptors: *Personnel selection, *Tests, National government, Test construction(Psychology), Validity, Specialized training, Government employees, Abilities.

The memorandum presents empirical research data in support of the construct validity of the U.S. Civil Service Commission's Test 650. The data presented are summary analyses of the results of a large number of published and unpublished criterion-related validity studies which involved item types identical or similar to those which comprise Test 650 and occupations similar to 13 of the 28 occupations for which Test 650 is used as a selection instrument. These analyses indicate that such types of items are highly predictive of both job proficiency and training success in the occupations examined and that these results are likely to hold for all 28 occupations covered by the examinations.

PB-298 487/0GA PC **A02**/MF **A01**
Office of Personnel Management, Washington, DC. Personnel Research and Development Center.
The Effect of Regional Accent and Recorded Administration on Performance on Tests of Following Oral Instructions.
Final rept.,
Robert C. Sapinkopf. Jun 79, 13p TM-79/3

Descriptors: *Tests, *Dialects, Verbal behavior, Instructional materials, Speech, Voice.
Identifiers: Language variation, Native speakers.

Scores on tests of following oral instructions can be affected by nonstandardized examining procedures. Two oral instructions tests were administered in Alabama and Mississippi by cassette tape recorded by a professional reader who spoke 'Metropolitan American English,' by cassette tape recorded by a southern examiner and by live examiner. Competitors administered the tape recorded by the professional reader performed statistically significantly better than those administered the other two methods on one test and not statistically significantly different from those administered the other two methods with the second test. The implications of these findings are discussed.

PB-298 606/5GA PC **A02**/MF **A01**
Office of Personnel Management, Washington, DC. Personnel Research and Development Center.
The Use of Self-Assessments in Examining.
Final rept.,
Ernest S. Primoff. Apr 79, 12p PROFESSIONAL SER-79-1
Proceedings of a Paper Presented at the Annual Convention of the American Psychological Association (86th), Toronto, Ontario, Canada, August 1978.

Descriptors: *Assessments, *Tests, Psychometrics, Minority groups, Validity, Test construction(Psychology).

Self-assessments combined with other evidences, such as achievements and test scores, lead to more accurate examining. Two factors affect the size of a correlation between a self-rating and another rating or a test: (a) a common understanding by raters and by test constructors of the elements to be rated or tested, and, (b) the extent of a common base for rating. The use of ratings in examinations requires adjustment for these factors. However, raw ratings may be used for psychometric analysis, using standard statistical tests of significance. Since minorities are usually represented in significant numbers among applicants but not in employed groups, studies involving self-ratings of applicants are useful in analyses designed to reduce adverse impact.

5K. Sociology

AD-A070 851/1GA PC **A04**/MF **A01**
Institute for Water Resources (Army) Fort Belvoir VA
Chief Joseph Dam Columbia River, Washington. Community Impact Report Update III. Conditions at Peak Impact.
Research rept.,
Arthur A. Harnisch. Dec 78, 68p Rept no. IWR-RR-78-R2

Descriptors: *Dams, *Economics, *Villages, Washington(State), Impact, Sociology, Construction, Labor.
Identifiers: Chief Joseph Dam.

This report examines how current peak construction social impacts on rural communities at Chief Joseph Dam, Washington compare with those projected in pre-construction phases. The report examines, in depth, the construction workers at the dam site; their previous employment, current living conditions and impacts on local communities. The report also generalizes about the methodologies for projecting social impacts. (Author)

AD-A070 852/9GA PC **A03**/MF **A01**
Institute for Water Resources (Army) Fort Belvoir VA
Doing Social Effects Assessment: Two Cases from a Corps Field District.
Final rept.,
Ruth Love. Nov 78, 49p Rept no. IWR-RR-78-R4

Descriptors: *Public relations, *Sociometrics, Management planning and control, Water quality, Flood control, Surveys, Questionnaires, Environmental tests, Human relations, Case studies.

This case study is intended to complement the 'how to do social effects analysis' thrust of recent manuals. It describes how a sociologist, working in a Corps of Engineers district, approached social effects assessment on two studies. The report describes both management and technical considerations involved in these assessments. It takes the reader through the step-by-step historical process of doing social effects assessment. (Author)

ED-163 894 Not available NTIS
American Bar Association, Washington, DC. Commission on Correctional Facilities and Services.
Inmate Involvement in Prison Legal Services: Roles and Training Options for the Inmate as Paralegal.
William P. Statsky. Mar 74, 105p
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$6.01, MF$0.83 Plus Postage.

Descriptors: Constitutional law, Guidelines, *Legal assistants, Legal problems, Legislation, *Prisoners, Recruitment, Research methodology, Resource materials, Role playing, Training, Training objectives, Training techniques.

An introduction to the role of the paralegal in the free world, the inmate as paralegal, legal service needs, and program planning are included along with guidelines for the training of inmates as paralegals. Paralegal services, legal problems, and legal services are extensively defined. The legal problems of inmates and methods of providing legal services other than through paralegal inmates are discussed. A number of models of inmate paralegal programs as well as descriptions of some major programs in this country are presented, and resources necessary for setting up training programs are discussed. Guidelines for trainers in the design of training programs for paralegals are included, emphasizing legal vocabulary, question and answer--anecdotal, and skills development. Trainee recruitment and techniques for teaching inmate paralegals how to state a claim, basic mechanical procedures, and constitutional law governing institutional life are also covered. Major curriculum issues that need to be explored in designing any training program are also discussed.

ED-163 908 Not available NTIS
New York State Office of Vocational Rehabilitation, Albany.
Planning the Use of Telecommunication in Vocational Rehabilitation,
Ben Park, and Arthur Pawlowski. Mar 78, 127p
Sponsored in part by Rehabilitation Services Administration, Washington, DC.
Available from ERIC Document Reproduction Service (Computer Microfilm International Corporation), Arlington, VA. 22210, PC$7.35, MF$0.83 Plus Postage.

Descriptors: Evaluation methods, Models, Program descriptions, Program design, Program development, Program planning, Systems approach, Technological advancement, *Telecommunication, *Vocational rehabilitation.

This study considers telecommunication as a technological extension of fundamental human communicaton, and elaborates on telecommunication in a specific area like vocational rehabilitation, the relevance of previous experience with telecommunication to vocational rehabilitation, deciding where telecommunication will be best placed in a process model for long range planning, and designing and using the process model. Sufficiency, reliability, adaptability, and utility are detailed as four criteria against which telecommunication systems can be evaluated so that the study may be used as an approach for planners in determining which problems in their local situations may be resolved by some form of telecommunication. A 57-item bibliography is included.

HRP-0029025/4GA Not Available NTIS
Audie L. Murphy Memorial Veterans Administration Hospital, San Antonio, TX.
Curanderismo -- Folk Mexican-American Health Care System.
Eloisa G. Tamez. 1978, 6p
Pub. in Jnl. of Psychiatric Nursing and Mental Health Services, v16, n12, p34-39, Dec 78.

Descriptors: Ailments, Communities, Consumer health education, Counseling, Demography, Diseases, Foreign countries, *Health care services,

Health care technology, Health care, Health education, Injuries, Methodology, Personal health services, Preventive medicine, Social services, Socioeconomic status, Sociology.

Concepts of culture and illness among Mexican-American folk medicine beliefs and practices are discussed. The migration of Mexicans to the United States and the close proximity of Mexico to the United States are important in adherence to language, traditional beliefs, and values of this ethnic group. The socioeconomic status of Mexican-Americans is directly related to the level of education. In Mexican society, the extended family adds a significant dimension, including aunts, uncles, grandparents, cousins, compadres, and comadres (godparents). Mexican-Americans view illness in both a religious and a social context. External forces cause illness. If physicians or other health professionals fail in treating illness, individuals turn to curanderos who attempt to remove the supernatural cause of illness. Curanderismo, a system of folk medicine beliefs and practices, is traced to Greek pathology. Curanderos fuse and integrate concepts and practices from diverse sources. They combine skills and various empirical and ritualistic remedies. The implications of curanderismo within the social framework of illness are examined in terms of such therapeutic interactions as health teaching.

HRP-0029472/8GA Not Available NTIS
Hawaii Nurses Association, Honolulu.
Culture, Childbearing and Health Professionals.
Ann L. Clark. 1978, 190p
Available from F. A. Davis Co., 1915 Arch St., Philadelphia, PA 19103.

Descriptors: Accessibility, Classifications, Communities, Demography, Documents, *Ethnic groups, *Health care, Information systems, Methodology, Socioeconomic status, Sociology, Sources, United states.

The childbearing experiences of various U.S. cultures, including the American Indian, the Afro-American, the Chinese American, the Japanese American, the Mexican American, the Puerto Rican, the Filipino American, the American Samoan, and the Vietnamese, are explored. For each group, the ways in which a culture values children, uses conception control, and perceives marriage and pregnancy are explored. Cultural taboos, prescriptions, and expectations associated with pregnancy, labor, the puerperium, and care of the neonate are also covered. Also included is an overview chapter which examines the concept of culture with a view towards providing guidelines to health professionals interested in understanding the possible relationships between the culture concept and the childbearing processes and in developing skills in decisionmaking and implementation of the decisions which are required in transcultural health settings. Biographical sketches of the authors, many of whom are nurses who are representatives of the cultures, are included. Photographs, bibliographical references, and tables are included.

NTIS/PS-79/0880/9GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Quality of Life in the Urban Environment. Volume 2. August, 1976-1977 (A Bibliography with Abstracts).
Rept. for Aug 76-77,
Mary E. Young. Sep 79, 255p*
See also Volume 1, 1964-July, 1976, NTIS/PS-77/0696.

Descriptors: *Bibliographies, *Quality of life, *Urban areas, Attitude surveys, Esthetics, Recreation, Metropolitan areas, Local government, Citizen participation, Services, Community relations, Land use.
Identifiers: Social conditions, Life styles.

The attitudes of people toward cities and their development and circumstances of living in urban areas are reviewed. In addition to general studies, reports on specific topics; such as transportation, citizen involvement in neighborhood activities, housing, and social services are included. (This updated bibliography contains 247 abstracts, none of which are new entries to the previous edition.)

NTIS/PS-79/0881/7GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Quality of Life in the Urban Environment. Volume 3. 1978-August, 1979 (A Bibliography with Abstracts).
Rept. for 1978-Aug 79,
Mary E. Young. Sep 79, 93p*
Supersedes NTIS/PS-78/0855, NTIS/PS-77/0697, NTIS/PS-76/0624, NTIS/PS-75/570, and NTIS/PS-74/125. See also Volume 1, 1964-July, 1976, NTIS/PS-77/0696 and Volume 2, August, 1976-1977, NTIS/PS-79/0880.

Descriptors: *Bibliographies, *Quality of life, *Urban areas, Attitude surveys, Esthetics, Recreation, Metropolitan areas, Local government, Citizen participation, Services, Community relations, Land use.
Identifiers: Social conditions, Life styles.

The attitudes of people toward cities and their development and circumstances of living in urban areas are reviewed. In addition to general studies, reports on specific topics; such as transportation, citizen involvement in neighborhood activities, housing, and social services are included. (This updated bibliography contains 85 abstracts, 59 of which are new entries to the previous edition.)

NTIS/PS-79/0887/4GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tourism and Vacation Travel: State and Local Government Planning (A Bibliography with Abstracts).
Rept. for 1964-Aug 79,
Edith Kenton. Sep 79, 162p*
Supersedes NTIS/PS-78/0800, NTIS/PS-77/0684, NTIS/PS-77/0575, NTIS/PS-77/0292, NTIS/PS-76/0306, and NTIS/PS-75/148.

Descriptors: *Bibliographies, *Travel, *Economic factors, Regional planning, Community development, Recreation, Economic development, Natural resources.
Identifiers: *Tourism, Tourist attractions, Outdoor recreation, Wilderness areas, Historic areas, Indian reservations, Vacation travel.

Economic and socioeconomic aspects of vacation travel and tourism in various localities of the United States are documented. Most of these studies deal with the use of tourism for the economic development of local communities. Special attention is given to wilderness, coastal zone, lake, waterway, and Indian Reservation areas. Planning for scenic and historic areas is cited. (This updated bibliography contains 154 abstracts, 25 of which are new entries to the previous edition.)

PB-298 187/6GA PC **A03**/MF **A01**
Washington State Dept. of Social and Health Services, Olympia.
Report: The Needs of the Elderly, 1978 (Washington).
1978, 50p

Descriptors: *Elderly persons, *Requirements, *Washington(State), Rural areas, Urban areas, Surveys, Education, Characteristics, Income, Health, Employment, Retirement, Pensions.

The report summarizes the survey of the needs of the elderly and it points out some of the alternatives available in helping fulfill those needs. It is not an attempt, however, to relate all of the information obtained in the needs survey. The data is stored in a computer and is available to organizations and individuals for appropriate uses. The survey yielded a wealth of data which will be of value for years to come in planning and implementing programs to improve on the conditions of senior citizens throughout the state.

PB-298 305/4GA PC **A02**/MF **A01**
Economics, Statistics, and Cooperatives Service, Washington, DC. National Economics Div.
Food Expenditure Patterns of Single-Person Households.
Agricultural economic rept. (Final),
Benjamin H. Sexauer, and Jitendar S. Mann. Jul 79, 22p AER-428

Descriptors: *Food habits, *Consumers, *Expenses, Socioeconomic status, Budgeting, Males, Females, Elderly persons, Income, Economic analysis, Households, Purchasing.

Single-person households differ widely in their food purchases according to income, age, and sex. Young upper income men spend more than half their food dollars dinning out, while elderly lower income women spend only about 10 percent. The young spend more than three times per week than the elderly on soft drinks. Men spend more on prepared foods (like frozen dinners) than women, and lower income young men spend more on prepared foods than any other of the 12 subgroups studied. Single-person households spend more on food than do multiperson households per person.

PB-298 374/0GA PC **A03**/MF **A01**
RAND Corp., Santa Monica, CA.
Demographic Structure and Implications of Recent Nonmetropolitan Growth. I: Synthesis of Previous Research.
Working note,
Peter A. Morrison. Sep 76, 38p WN-9627-EDA, EDA/OER-79/079
Grant EDA-OER-513-G-76-5

Descriptors: *Demographic surveys, *Rural areas, Demography, Population growth, Urban areas, Population migration, Migration, Education, Regions, Relocation.
Identifiers: *Rural population, Rural resettlement.

The document reviews the demographic structure of population changes occurring in nonmetropolitan areas and the variations in these changes in different parts of the country. The underlying causes of these changes are examined. Migration and the urban-rural distinction are defined.

PB-298 466/4GA PC **A08**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Alcohol Availability, Consumption and the Incidence of Alcohol-Related Social and Health Problems in Michigan.
Final rept. Oct 77-Sep 78,
Richard L. Douglass, Alexander C. Wagenaar, and Patrick M. Barkey. May 79, 151p UM-HSRI-79-10-I
See also PB-298 467. Sponsored in part by Michigan Dept. of Public Health, Lansing. Office of Substance Abuse Services.

Descriptors: *Alcoholic beverages, *Michigan, *Availability, Consumption, Mortality, Accidents, Time series analysis, Public health.

Cross-correlation, time-series-modelling and multiple regression analyses were utilized with available Michigan data to explore causal relationships between beverage alcohol licensing actions of the Michigan Liquor Control Commission, alcohol beverage distribution, and a number of major social and health problems. While conclusions are not definitive because of limitations in the data, it was found that mortality due to traffic accidents, occupational accidents, and total reported accidents is strongly and consistently associated with increases in alcohol availability and with draught and packaged beer distribution. Other analyses determined that beverage alcohol distribution is highly predictable by using time-series analysis techniques. Multiple regression analyses, interpreted in connection with the other findings, suggested that wine distribution is probably more vulnerable to changes in licensing activities than beer or liquor distribution. Implications of the findings and suggestions regarding data collection adequacy in Michigan are offered.

PB-298 467/2GA PC **A03**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Alcohol Availability, Consumption and the Incidence of Alcohol-Related Social and Health Problems in Michigan.
Executive summary Oct 77-Sep 78,
Richard L. Douglass, Alexander C. Wagenaar, and Patrick M. Barkey. May 79, 30p UM-HSRI-79-10-II
See also PB-298 466. Sponsored in part by Michigan Dept. of Public Health, Lansing. Office of Substance Abuse Services.

Descriptors: *Alcoholic beverages, *Michigan, *Availability, Consumption, Mortality, Accidents, Time series analysis, Public health.

The regulation and control of alcoholic beverages has received considerable attention in recent years as a potentially viable means of reducing social problems related to alcohol use and abuse. The full range of social problems, of which a proportion are causally related to alcohol abuse, includes all forms of accidental injury and death, domestic and criminal violence, and several chronic disease mortalities, including the broadly defined alcoholism and narrowly defined alcoholic cirrhosis. The intention of this study is to learn more about the dynamics of alcohol availability, alcohol distribution, and several social and health problems which are, in part, associated with the abuse of beverage alcohol.

PB-298 570/3GA PC **A06**/MF **A01**
American Institutes for Research, Washington, DC.
Socio-Economic Policies and Programs for the Elderly.
Final rept.
May 79, 118p DLMA-20-11-79-11-1
Grant DL-20-11-79-11

Descriptors: *Elderly persons, *Socioeconomic status, Legislation, Employment, Retirement, Income, Discrimination, Policies, Project management.

The five-part report provides information requested by OECD about socio-economic policies regarding the elderly in the United States. The first part provides an overview of current status and recent trends in such areas as labor force participation of older workers, education, industrial-occupational distribution, part-time employment, earnings, unemployment, and retirement (including retirement income). The second part of the report focuses on features of retirement income systems in the United States. These include the social security program (which covers nearly all workers), as well as government employee and private sector pension plans. The third section of the report deals with a number of government policies and programs aimed at improving the continued participation of older adults in the labor force and at alleviating unemployment problems among members of this age group. The fourth part examines a wide range of programs and activities pertaining to the improvement of social participation among older persons. These include housing, the humanities, retirement preparation, and health services. The fifth and final section explores some significant socio-economic policy issues regarding the elderly in the United States.

PB-298 641/2GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
A Second Look at the Heavy Half of the Camping Market.
Forest Service research paper (Final),
Wilbur F. LaPage, and Dale P. Ragain. 1971, 11p
FSRP-NE-196, NEFES/79-51

Descriptors: *Recreation, Market surveys, Demography, Statistical data.
Identifiers: *Camping, Camping facilities.

Annual camping participation figures supplied by a panel of over 500 campers for 4 years were used to make a detailed study of the heavy half of a camping market. In 3 out of 4 years, the heavy half did more than 80 percent of all reported camping. One-fourth of the panel was consistently in the heavy half, year after year; and they were responsible for more than 50 percent of the total reported camping activity during the 4 years. A decreasing trend in camping participation was found to be strongly and inversely related to the number of years a camper was in the heavy half of the camping market.

PB-298 676/8GA PC **A10**/MF **A01**
Institute of Man and Science, Rensselaerville, NY.
Partnerships for Neighborhood Preservation: A Citizen's Handbook,
Rick Cohen. Dec 78, 219p
Grant HUD-B-76-SI-42-0001
Prepared by Cohen (Rick) and Associates, Hoboken, NJ. Sponsored in part by Pennsylvania Dept. of Community Affairs, Harrisburg.

Descriptors: *Urban development, *Neighborhoods, *Pennsylvania, Citizen participation, Local government, State government, Communities, Project planning, Evaluation.

The handbook is one of several substantial outcomes of the Pennsylvania Department of Community Affairs' Neighborhood Preservation Support System (NPSS). This new effort was DCA's recognition of the importance of neighborhoods in urban life. Cities cannot survive without a range of strong neighborhoods, yet during DCA's long history of urban renewal activities the Department had not dealt with neighborhoods. A decision was made to change the utilization of some of the Department's 1976-77 housing and development funds. In addition, a strong supplement of technical assistance was programmed for municipal governments and neighborhood groups involved in revitalizing neighborhoods. This process, would be more than just a physical rehabilitation of the neighborhood's houses. It would involve an assessment of the social and economic needs of the neighborhood as well as providing a base of overall physical improvement. Development of a strong neighborhood group to aid in identifying and planning the preservation activities is the fourth and most important element in the process. A strong focus was to be placed on creating 'partnerships' with neighborhood groups, the municipal government, and private market forces in a flexible coalition, assisting one another in preservation activities.

PB-298 877/2GA PC **A10**/MF **A01**
American Bar Association, Washington, DC.
Activities of the Transitional Aid Research Project of the Commission on Correctional Facilities and Services.
Final rept. 1975-78,
Robert Horowitz, and Melvin T. Axilbund. Aug 78, 214p DLMA-21-11-75-19-A
Grant DL-21-11-75-19

Descriptors: *Correctional institutions, *Placement, Services, State government, Manpower, Economic assistance, Income, Employment, Unemployment.
Identifiers: Offenders, Ex-offenders.

The report documents the background and development of the two State (Georgia and Texas) Transitional Aid Research Project for Ex-Offenders and notes the problems and difficulties encountered in implementing the project. In addition, it explores various judicial, social, political, legislative and other issues involved in providing short-term financial and/or job placement assistance to ex-inmates newly released from prison as did the Georgia-Texas endeavor. The aim of the TARP project was to test whether transitional monetary support (comparable in amount to weekly unemployment compensation) and job placement services would enhance rates of employment and reduce rates of rearrest among former offenders.

PB-298 913/5GA PC **A02**/MF **A01**
Human Interaction Research Inst., Los Angeles, CA.
Quality of Worklife (QWL), Programs: a Preliminary Technology Assessment,
Edward M. Glaser. 1977, 10p NSF/RA-770770

Descriptors: *Quality of life, *Job satisfaction, Productivity, Technology innovation, Work measurement.
Identifiers: Quality of worklife.

The research plan is to study three organizations that have successful worklife programs of at least two years' duration and to compare them with three organizations of similar type, size, and other pertinent variables which have not attempted any special improvement programs. The data gathered generated preliminary information about the first- and second-order effects. First-order effects include proximate, relatively observable, direct effects on: (1) the work organization in terms of costs, productivity, quality, and evidences of withdrawal versus ego-involvement in the work; and (2) the individual in terms of attitudes and perceptions toward the organization and its people, policies, and programs that constitute their worklife. Second-order effects on the work organization and the individual are only indirectly associated with the worklife program.

PB-298 953/1GA PC **A08**/MF **A01**
Texas State Dept. of Mental Health and Mental Retardation, Austin. Office of Program Analysis and Statistical Research.
A Longitudinal Study of Selected Clients Treated for Alcoholism in the Texas Department of Mental Health and Mental Retardation Treatment Facilities in 1973,
Jack L. Franklin, Bruce G. Hudson, Nancy D. Dittmar, and Mark Mason. Jul 79, 162p NIAAA/NCALI-79/12
Contract PHS-ADM-281-77-0014

Descriptors: *Alcoholism, *Drug addiction, Statistical data, Data collection, Demography, Patients, Behavior, Texas, Mental health, Therapy, Interviews, Comparisons, Signs and symptoms, Socioeconomic factors, Diseases, Characteristics, Classifications, Sex, Age.
Identifiers: Drug treatment programs, Chronic diseases.

The study presents the results of information collected through interviews with 261 clients held one year and four and one half years after they were treated for alcoholism in Texas Department of Mental Health and Mental Retardation Alcoholism Treatment facilities. Alcohol involvement in this study is reported in terms of consequences and symptoms of chronic alcohol involvement along with current consumption patterns. Thirty-one percent of the patients reported abstinence for a year or more at the latest follow-up, while thirty-four percent reported both consequences and symptoms of chronic alcohol involvement. Comparison of the data collected at the two interviews indicates a great deal of change: Many of those drinking heavily at the first follow-up were now abstinent and vice versa. The authors suggest that, for some alcoholics, drinking behavior progresses in cycles from heavy drinking to abstinence and back to heavy drinking.

PB-298 958/0GA PC **A04**/MF **A01**
Economics, Statistics, and Cooperatives Service, Washington, DC. Economic Development Div.
Indexes and Rankings for Indicators of Social Well-Being for U.S. Counties, Statistical Supplement.
Rural development research rept. 1965-70,
Peggy J. Ross, Herman Bluestone, and Fred K. Hines. May 79, 75p* RDRR-10-SUP

Descriptors: *Socioeconomic status, *Quality of life, *Indexes(Ratio), United States, Populations, Demographic surveys, Counties, Ranking, Health, Family relations, Rural areas, Metropolitan areas, Alienation, Sociology, Economic surveys, Sociopsychological surveys, Statistical analysis.
Identifiers: *Family status, Rural development.

The document contains statistical data which supplements earlier research released on the topic of social well-being in the United States. Indexes of socioeconomic status, health status, family status and alienation are provided for 3,097 U.S. counties.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A070 755/4GA PC **A03**/MF **A01**
Pritzker School of Medicine Chicago IL Dept of Surgery
The Manufacture and Study of Hemoglobin - Saline Solution.
Rept. for 1 Jul 79-30 Jun 80,
Gerald S. Moss. 1979, 46p
Contract DADA17-71-C-1106
Prepared in cooperation with Michael Reese Hospital and Medical Center, Chicago, IL.

Descriptors: *Hemoglobin, Erythrocytes, Saline solution, Blood analysis, Test methods, Oxygen, Tables(Data).
Identifiers: Preparation.

The purpose of this paper is to describe a technique for simple and rapid preparation of pyridoxalated hemoglobin (SFH-P) in volumes up to 20 liters at 20 gm% hemoglobin concentration.

AD-A070 872/7GA Not available NTIS
Minnesota Univ Austin Hormel Inst

The Effect of Partially Hydrolyzed Casein on the Growth of Human Skin Diploid Cells 'In vitro' (40388),
H. M. Jenkin, T. K. Yang, and L. E. Anderson. 4 May 78, 4p
Contract N00014-75-C-0903
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v160 p59-62 1979. (No copies furnished by DDC).

Descriptors: *Casein, Hydrolysis, Growth(Physiology), Skin(Anatomy), Human body, In vitro analysis, Reprints.
Identifiers: Cells(Biology), *Cell cultures.

No abstract available.

AD-A070 977/4GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Coping with Convection in the Ultracentrifuge.
Medical research rept.,
David B. Millar, and John P. Christopher. 4 Nov 77, 10p Rept no. NMRI-78-110
Pub. in Analytical Biochemistry, v90 p33-40 1978.

Descriptors: *Ultracentrifuges, Biochemistry, Convection, Molecular weight, Vibration, Sedimentation, Cells(Biology), Temperature, Reprints.

No abstract available.

BNL-25851 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Synthesis of (Exp 18 F)-5-Fluorouridine (F-18-5-FUR) as a Probe for Measuring RNA Synthesis and Tumor Growth Rates in Vivo.
C. Y. Shiue, J. S. Fowler, R. R. MacGregor, and A. P. Wolf. 1979, 8p CONF-790321-7
Contract EY-76-C-02-0016
International symposium on radiopharmaceuticals, Seattle, WA, USA, 18 Mar 1979.

Descriptors: *Fluorouracils, *Neoplasms, *Probes, *RNA, Biosynthesis, Brookhaven cyclotron, Fluorine 18, Growth, Measuring methods, Nuclear reaction kinetics, Synthesis.
Identifiers: ERDA/550200, ERDA/550201, *Ribonucleic acids, *Fluorouridine, *Synthesis(Chemstry), In vivo analysis.

For abstract, see ERA citation 04:043795.

PB-298 892/1GA PC **A02**/MF **A01**
Center for Disease Control, Atlanta, GA. Bureau of Labs.
An Interlaboratory Study of Amylase Methodologies Using Purified Enzyme Materials,
Thomas L. Hearn, Eric J. Sampson, Virginia S. Whitner, Sarah S. McKneally, and D. Joe Boone. 30 Nov 78, 23p HEW/CDC/BL-79/0002, DHEW/PUB/CDC-79-0002

Descriptors: *Amylase, *Enzymes, Methodology, Linearity, Activity, Reproducibility, Biochemistry, Experimental data.

An interlaboratory study of amylase methodologies was conducted by the Center for Disease Control November 30, 1978. Participants in the study analyzed 7 samples for amylase activity -- 5 with a simulated serum matrix containing purified pancreatic amylase and 2 with normal urine matrix -- and provided information regarding their methodology. More than 23 different methods were used by the participants to measure amylase activity. The coefficients of variation, by method, of the interlaboratory results for amylase-containing samples were typically 10% to 40%. The interlaboratory results suggested that some of the commonly used amylase methods may be nonlinear. The clinical classification assigned to an amylase result was method dependent.

PB-299 018/2GA PC **A06**/MF **A01**
Karolinska Institutet, Stockholm (Sweden).
A Study of Uremic Toxicology.
Annual rept. 1 Jan 78-28 Feb 79,
Jonas Bergstrom, Peter Furst, and Zena Zimmerman. 28 Feb 79, 102p AK-5-2-2215-79
Contract N01-AM-2-2215
See also report dated 15 Jan 78, PB-285 632. Prepared in cooperation with Saint Eriks Hospital, Stockholm (Sweden). Errata sheet inserted.

Descriptors: *Toxicology, *Uremia, *Blood chemical analysis, *Molecules, Chromatographic analysis, Surgical transplantation, Dialysis, Experimental data, Body fluids, Filtration, Separation, Bioassay, Patients, In vivo analysis, In vitro analysis, Peptides, Urea, Excretion.
Identifiers: *Urinalysis, Ultrafiltration, Peritoneal dialysis, Hemodialysis, *Metabolites.

By using an automatic analyzer MM data were examined in relation to diagnoses, protein intake, incidents of various uremic and non-uremic complications, different biochemical indices in plasma, residual function. It was found in 127 analyses from 93 non-dialyzed patients, in 175 analyses from 53 hemodialysis patients and in 35 analyses from 25 peritoneal dialysis patients that those with polycystic kidneys had on average lower plasma 7c than other group of patients. Patients with edema had higher levels of 7a and 7b than patients who were free of major symptoms. Infection and pericarditis were associated with elevated concentration of peak 7c. In malnutrition all MM peaks were elevated. These results suggest that uremic 'sickness' is more strongly associated with high MM levels than with high urea or creatinine concentrations in plasma. The estimated volume of distribution of MM appears to be much smaller than for urea and creatinine. The peptidic material derived from 7c preparation was examined with the use of amino acid analyses, weight determination, isotachophoresis, high voltage electrophoresis, and trials were also made to determine the N- and C-terminals. The main peptide material consisted of a poly-glycine chain with acidic properties. The amount of glycine corresponded to about 30% of dry weight, thus other peptide-bound solutes are present in the preparation. The N-terminal was blocked and the C-terminal was found to be glycine. Beyond the acidic peptide the presence of another neutral peptidic material was demonstrated. MM peaks 7a and 7b also contains peptidic material, with different amino acid pattern and proportions than 7c.

UR-3490-1259 PC **A03**/MF **A01**
Rochester Univ., NY. Dept. of Radiation Biology and Biophysics.
Preparation and Spectroscopic Characterization of Molecular Species of Brain Phosphatidylserines.
N. Salem, Jr., P. Serpentino, J. S. Puskin, and L. G. Abood. 42p
Contract EY-76-C-02-3490

Descriptors: *Brain, *Phospholipids, Chemical analysis, Chemical preparation, Chemical properties, Nmr spectrometers, Serine, Spectroscopy.
Identifiers: ERDA/550200.

For abstract, see ERA citation 04:045418.

UR-3490-1543 PC **A02**/MF **A01**
Rochester Univ., NY.
"Aged" (Dense) Circulating Red Cells Contain Normal Concentrations of ATP.
F. H. Kirkpatrick, A. G. Muhs, R. K. Kostuk, and C. W. Gabel. 1978, 7p
Contract EY-76-C-02-3490

Descriptors: *ATP, *Erythrocytes, Abundance, Age dependence, Biochemistry, Blood, Chemical analysis, Ecological concentration, Lasers, Luciferase, Luciferin, Lysis.
Identifiers: ERDA/550200, *Adenosine phosphates, Concentration(Composition).

For abstract, see ERA citation 04:041711.

6B. Bioengineering

AD-A070 648/1GA Not available NTIS
State Univ of New York at Buffalo Dept of Physiology
Apparatus for Intracellular Electrophysiological Measurements at 200 ATA,
Joseph V. Henderson, Jr., Richard A. Morin, and Edward H. Lanphier. 3 Jun 74, 4p
Contracts N00014-71-C-0342, N00014-76-C-0472
Availability: Pub. in Jnl. of Applied Physiology, v38 n2 p353-355 Feb 75. (No copies furnished by DDC).

Descriptors: *Measuring instruments, Electrophysiology, Pressure measurement, High pressure, Reprints.
Identifiers: Intracellular recording.

No abstract available.

LA-7642-PR PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Electronic Identification. Progress Report, October 1, 1977--September 30, 1978.
D. M. Holm, G. L. Seawright, W. M. Sanders, R. E. Bobbett, and J. A. Landt. May 79, 23p
Contract W-7405-ENG-36

Descriptors: *Domestic animals, *Electronic equipment, Design, Specifications.
Identifiers: ERDA/440300.

For abstract, see ERA citation 04:045298.

PATENT-4 154 230 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
Biomedical Ultrasonoscope.
Patent,
R. D. Lee. Filed 30 Sep 76, patented 29 May 79, 12p N79-26771/2, PAT-APPL-759 965
Supersedes PAT-APPL-759 965-76, N77-15619 (15 - 06, p 0786).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: *Biomedical data, *Biometrics, *Ultrasonic radiation, Bioinstrumentation, *Patents, Scanners, Signal reflection.
Identifiers: PAT-CL-128-660.

The invention is a combination of a C mode scan electronics in a portable, battery powered biomedical ultrasonoscope having A and M mode scan electronics. The C mode scan electronics comprises a plurality of transducer elements arranged in a row and adapted to be positioned on the skin of the patient's body for: (1) converting a pulsed electrical signal to a pulsed ultrasonic signal, (2)radiating the ultrasonic signal into the patient's body,(3) picking up the echoes reflected from interfaces in the patient's body, and (4) converting the echoes to electrical signals. Each transmitter is coupled to a respective tranducer for transmitting a pulsed electrical signal and for transmitting the convected electrical echo signals directly to the receiver.

PATENT-4 158 895 Not available NTIS
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
Prosthesis Coupling.
Patent,
J. B. Reswick, V. Mooney, C. W. Bright, and L. J. Owens. Filed 9 Feb 78, patented 26 Jun 79, 4p N79-26772/0, PAT-APPL-876 438
Supersedes PAT-APPL-876 438-78, N78-22721 (16 - 13, p 1754).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: *Biodynamics, *Bioengineering, *Couplings, *Limbs(Anatomy), *Prosthetic devices, *Sleeves, Adhesive bonding, Bones, Carbon, Fittings, *Patents, Skin(Anatomy), Stress(Physiology).
Identifiers: PAT-CL-3-2.

A coupling for use in an apparatus for connecting a prosthesis to the bone of a stump of an amputated limb is described which permits a bio-compatible carbon sleeve forming a part of the prosthesis connector to float so as to prevent disturbing the skin seal around the carbon sleeve. The coupling includes a flexible member interposed between a socket that is inserted within an intermedullary cavity of the bone and the sleeve. A lock pin is carried by the prosthesis and has a stem portion which is adapted to be coaxially disposed and slideably within the tubular female socket for securing the prosthesis to the stump. The skin around the percutaneous arbon sleeve is able to move as a result of the flexing coupling so as to reduce stresses caused by changes in the stump shape and/or movement between the bone and the flesh portion of the stump.

6C. Biology

AD-A070 650/7GA Not available NTIS
State Univ of New York at Buffalo Dept of Physiology
Slowing of Ionic Currents in the Voltage-Clamped Squid Axon by Helium Pressure,
Joseph V. Henderson, Jr., and Daniel L. Gilbert. 25 Jul 75, 2p
Contract N00014-76-C-0472
Availability: Pub. in Nature, v258 p351-352, 27 Nov 75. (No copies furnished by DDC).

Descriptors: *Current regulators, Helium, Ions, Pressure, High pressure, Clamps, Voltage regulators, Reprints.
Identifiers: *Squids, Invertebrates, Mollusca.

No abstract available.

AD-A070 841/2GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Corrections in the Nomenclature of Three Anophelines (Diptera: Culicidae),
Ronald A. Ward. 1979, 6p
Pub. in Mosquito Systematics, v11 n2 p130-134 1979.

Descriptors: *Anopheles, Taxonomy, Reprints.
Identifiers: *Nomenclature, Culicidae, *Mosquitoes.

No abstract available.

AD-A070 979/0GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Human Lymphoid Cell Lines as Targets for DRw.
Medical research progress rept.,
Douglas M. Strong, Michele A. Pellegrino, and Soldano Ferrone. 1978, 10p Rept no. NMRI-78-114
Grants PHS-AI13154, PHS-CA16071
Pub. in In Vitro, v14 n12 p989-995 1978.

Descriptors: *Lymphocytes, Cells(Biology), Antigens, Naval research, Medical research, Reprints.
Identifiers: *Lymphoid cells.

No abstract available.

AD-A070 984/0GA PC **A02**/MF **A01**
Texas Univ at Houston School of Public Health
Field Studies on the Population Biology of Immature Stages of Six Woodland Mosquito Species in the Houston, Texas Area,
Donald R. Roberts, and John E. Scanlon. 1979, 11p
Contract DADA17-72-C-2022
Pub. in Mosquitio News, v39 n1 p26-34 Mar 79.

Descriptors: *Culicidae, *Aedes, Population, Sampling, Behavior, Texas, Reprints.
Identifiers: Psorophora, *Mosquitoes.

No abstract available.

IDO-12089 PC **A03**/MF **A01**
Department of Energy, Idaho Falls, ID. Idaho Operations Office.
Raptors of the Idaho National Engineering Laboratory Site.
T. H. Craig. Apr 79, 30p
Contract W-7405-ENG-82

Descriptors: *Birds, *Idaho National Engineering Laboratory, Baseline ecology, Migration, Population dynamics.
Identifiers: ERDA/500100, ERDA/500500, ERDA/550100.

For abstract, see ERA citation 04:043719.

LA-UR-79-1069 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Models for the Interaction Between Cells of the Immune System.
G. I. Bell. 1978, 10p CONF-7805177-1
Contract W-7405-ENG-36
Systems theory in immunology conference, Rome, Italy, 29 May 1978.

Descriptors: *Animal cells, *Cell membranes, *Immune reactions, *Lymphocytes, Behavior, Control, Immunity, Mathematical models, Morphological changes.
Identifiers: ERDA/550300, Interactions, Immune responses.

For abstract, see ERA citation 04:043805.

LA-7796-PR PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Probes. Progress Report, October 1, 1977--September 30, 1978.
D. M. Holm, and T. J. Bornhorst. May 79, 8p
Contract W-7405-ENG-36

Descriptors: *Biological materials, *Boll weevil, Feasibility studies, Monitoring, Pattern recognition, Pest control, Research programs, Trace amounts, X-ray fluorescence analysis.
Identifiers: ERDA/400103, ERDA/553001, Trace elements, Concentration(Composition), Insects.

For abstract, see ERA citation 04:043500.

PB-298 199/1GA PC **A04**/MF **A01**
Ecology Consultants, Inc., Fort Collins, CO.
Capture Locations of Rare Fish in the Upper Colorado River System,
Timothy W. Joseph. Dec 78, 53p FWS/OBS-78/32
Contract DI-14-16-0009-77-049
Library of Congress catalog card no. 78-600163. Sponsored in part by Environmental Protection Agency, Washington, DC. Office of Energy, Minerals and Industry.

Descriptors: *Trout, *Fresh water fishes, *Distribution(Property), *Colorado River, Sites, Fishing, Colorado, Utah, Wyoming, New Mexico.
Identifiers: Salmo clarki, Rhinichthys osculus, Ptychocheilus lucius, Xyrauchen texanus, Gila elegans, Gila cypha, *Rare fishes.

This report is a compilation of information regarding the distribution of the following species in the upper Colorado River system: Colorado cutthroat trout (Salmo clarki), Kendall Warm Springs dace (Rhinichthys osculus), Colorado squawfish (Ptychocheilus lucius), humpback sucker (Xyrauchen texanus), bonytail chub (Gila elegans), and humpback chub (Gila cypha). State-specific capture locations of the fish are plotted for Colorado, Utah, Wyoming and New Mexico.

PB-298 484/7GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
The Role of Behavior in the Dispersal of Newly Hatched Gypsy Moth Larvae.
Forest Service research paper (Final),
Michael L. McManus. 1973, 14p FSRP-NE-267, NEFES/79-84

Descriptors: *Behavior, *Lepidoptera, *Dispersions, Larvae, Temperature, Humidity, Methodology, Procedures, Distribution.
Identifiers: *Porthetria dispar, *Gypsy moth.

Study of the behavior of newly hatched gypsy moth larvae showed that they are well adapted for airborne dispersal. Hatching, moving off the egg mass, and dropping on silken threads--which makes them susceptible to being transported by the wind--are described. Larval activity depends on temperature and relative humidity.

PB-298 742-T/GA PC **A11**/MF **A01**
Smithsonian Institution, Washington, DC.
Polychaete Worms of the Family Paraonidae Cerruti, 1909 (Polychaeta, Sedentaria),
V. E. Strelzov. c1979, 239p TT-76-52002
Trans. of mono. Mnogoshchetinkove Chervy Semeistva Paraonidae Cerruti, 1909 (Polychaeta, Sedentaria), Leningrad, by Indira Kohli. Sponsored in part by National Science Foundation, Washington, DC. Special Foreign Currency Science Information Program.

Descriptors: *Worms, Invertebrates, Morphology, Ecology, Distribution, Geography.
Identifiers: *Polychaeta.

This monograph describes and revises the world fauna of the widely distributed, but to date poorly studied, family of polychaetes. The book presents data on the morphology, systematics, ecology, and the geographic distribution of this group of animals. The problem of generic affiliations of paraonids with other families of polychaetes is discussed. (Copyright (c) 1979, Oxonian Press Pvt. Ltd., New Delhi.)

PB-298 916/8GA PC **A02**
National Marine Fisheries Service, Auke Bay, AL. Auke Bay Lab.
Simple Venturi Device for Mixing Freshwater and Seawater in an Estuarine Culture System,
William R. Heard, and Frederick H. Salter. Jul 78, 6p NOAA-79070906
Pub. in the Progressive Fish-Culturist, v40 n3 p101-103 Jul 78.

Descriptors: *Fresh water, *Sea water, *Aquaculture, *Little Port Walter Estuary, Mixing, Polyvinyl chloride, Gravity, Salinity, Licenses, Venturi tubes, Estuaries, Alaska.
Identifiers: Reprints.

A venturi device made from standard sizes of polyvinyl chloride plumbing and rod-stock material was tested at Little Port Walter, an estuary in southeastern Alaska. When installed in a gravity-fed freshwater delivery system, the venturi injected seawater into the discharge water to produce a stable water flow of intermediate salinity. The use of interchangeable components with different-sized openings permits regulation of the salinity of the discharge water.

PB-298 926/7GA PC **A02**
National Marine Fisheries Service, Auke Bay, AK. Auke Bay Lab.
Evaluation of Three Methods of Handling Gametes of Sockeye Salmon for Transport to Incubation Facilities,
Michael L. Dahlberg, Jack E. Bailey, and William S. Pinette. Apr 78, 6p NOAA-79070904
Pub. in The Progressive Fish-Culturist, v40 n2 p71-72 Apr 78.

Descriptors: *Eggs, *Salmon, *Materials handling, *Reproduction(Biology), Aquaculture, Laboratories, Alaska, Survival, Bristol Bay, Naknek Lake.
Identifiers: Reprints, *Oncorhynchus nerka, Incubation.

Three methods of handling eggs and sperm of sockeye salmon (Oncorhynchus nerka) were tested from the time the gametes were taken from the fish at Naknek Lake, Bristol Bay, until they arrived at the incubation facility at King Salmon, western Alaska.

PB-298 927/5GA PC **A06**/MF **A01**
Florida Agricultural Market Research Center, Gainesville.
Commercial Fishing Activity and Facility Needs in Florida: Charlotte, Collier, and Lee Counties,
Kary Mathis, James C. Cato, Robert L. Degner, Paul D. Landrum, and Fred J. Prochaska. Feb 79, 102p FAMRC/IR-79/2, NOAA-79062605
See also PB-298 928. Prepared in cooperation with Gulf and South Atlantic Fisheries Development Foundation, Inc., Tampa, FL.

Descriptors: *Seafood, *Industries, *Fishing, Market value, Boats, Improvement, Licenses, Personnel, Services, Marine terminals, Florida.
Identifiers: Sea Grant program, Charlotte County(Florida), Collier County(Florida), Lee County(Florida), *Catch statistics, Commercial fishing.

Information on the commercial seafood industries of Charlotte, Collier and Lee Counties was obtained from published reports and from a mail survey of commercial fishermen and seafood dealers. Total seafood landings in the three counties were valued at $6.8 million in 1971. By 1976, landings had increased in value to $14.9 million. About 650 people were engaged in commercial fishing and 25 firms were registered to dealers. Registrations of commercial boats declined in the three counties from 1963-64 to 1977-78, but pleasure boat registrations tripled. Fishermen and dealers noted improvements they felt were needed in facilities and services in the ports and landing areas used.

PB-298 928/3GA PC **A05**/MF **A01**
Florida Agricultural Market Research Center, Gainesville.

Commercial Fishing Activity and Facility Needs in Florida: Dade and Monroe Counties,
Kary Mathis, James C. Cato, Robert L. Degner, Paul D. Landrum, and Fred J. Prochaska. Feb 79, 82p FAMRC/IR-79/3, NOAA-79062606
See also PB-298 929. Prepared in cooperation with Gulf and South Atlantic Fisheries Development Foundation, Inc., Tampa, FL.

Descriptors: *Industries, *Fishing, *Florida, Seafood, Boats, Regulations, Licenses, Services, Marine terminals.
Identifiers: Sea Grant program, Commercial fishing, Dade County(Florida), Monroe County(Florida).

Information on the commercial seafood industries of Dade and Monroe Counties was obtained from published reports and from a mail survey of commercial fishermen and seafood dealers. Total seafood landings in the two counties were valued at $14.6 million in 1971. By 1976, landings had increased in value to $26.6 million. About 950 people were engaged in commercial fishing and 50 firms were registered as dealers. Registrations of commercial boats declined in Dade County but increased in Monroe County from 1963-64 to 1977-78, while pleasure boat registrations nearly tripled in the two counties together. Fishermen and dealers noted improvements they felt were needed in facilities and services in the ports and landing areas used.

PB-298 929/1GA PC **A07**/MF **A01**
Florida Agricultural Market Research Center, Gainesville.
Commercial Fishing Activity and Facility Needs in Florida: Hillsborough, Manatee, Pasco, Pinellas, and Sarasota Counties,
Kary Mathis, James C. Cato, Robert L. Degner, Paul D. Landrum, and Fred J. Prochaska. Feb 79, 134p FAMRC/IR-79/4, NOAA-79062607
See also PB-298 927. Prepared in cooperation with Gulf and South Atlantic Fisheries Development Foundation, Inc., Tampa, FL.

Descriptors: *Seafood, *Fisheries, *Fishing, Market value, Surveys, Industries, Merchant ships, Boats, Licenses, Surveys, Marine terminals, Florida.
Identifiers: Sea Grant program, *Commercial fishing, Hillsborough County(Florida), Manatee County(Florida), Pasco County(Florida), Pinellas County(Florida), Sarasota County(Florida).

Information on the commercial seafood industries of Hillsborough, Manatee, Pasco, Pinellas and Sarasota Counties was obtained from published reports and from a mail survey of commercial fishermen and seafood dealers. Total seafood landings in the five counties were valued at $3.8 million in 1971. By 1976, landings had increased in value to $11.6 million. About 730 people were engaged in commercial fishing and 50 firms were registered as dealers. Registrations of commercial boats declined in the five counties from 1963-64 to 1977-78, but pleasure boat registration tripled. Fishermen and dealers noted improvements they felt were needed in facilities and services in the ports and landing areas used.

PB-298 967/1GA PC **A08**/MF **A01**
Florida Agricultural Market Research Center, Gainesville.
Commercial Fishing Activity and Facility Needs in Florida: Brevard, Broward, Indian River, Martin, Palm Beach, St. Lucie, and Volusia Counties,
Kary Mathis, James C. Cato, Robert L. Degner, Paul D. Landrum, and Fred J. Prochaska. Feb 79, 160p FAMRC-IR-79-1, NOAA-79062604
Prepared in cooperation with Gulf and South Atlantic Fisheries Development Foundation, Inc., Tampa, FL.

Descriptors: *Seafood, *Industries, Surveys, Personnel, Businesses, Fishing, Regulations, Licenses, Boats, Improvement, Market value, Marine terminals, Florida.
Identifiers: Sea Grant program, *Commercial fishing.

Information on the commercial seafood industries of Brevard, Broward, Indian River, Martin, Palm Beach, St. Lucie and Volusia Counties was obtained from published reports and from a mail survey of commercial fishermen and seafood dealers. Total seafood landings in the seven counties were valued at $4.8 million in 1971. By 1976, landings had increased in value to $9.1 million. About 920 people were engaged in commercial fishing and 50 firms were registered as dealers. Registrations of commercial boats declined in the seven counties from 1963-64 to 1977-78, but pleasure boat registrations tripled. Fishermen and dealers noted improvements they felt were needed in facilities and services in the ports and landing areas used.

PB-299 241/0GA PC **A02**
Maine Univ., Walpole. Ira C. Darling Center for Research, Teaching and Service.
The Impact of Toxic Dinoflagellate Blooms on the North American Shellfish Industry,
Richard A. Lutz, and Lewis S. Incze. 1979, 10p MSG/TR-42, NOAA-79071305
Pub. in Toxic Dinoflagellate Blooms, Taylor/Seliger (Eds.), p476-483, 1979.

Descriptors: *Dinoflagellata, *Environmental impacts, *Plankton blooms, *Shellfish, Toxicity, Economic analysis, Statistical data, Tables(Data), Losses, Social effect, Rhodophyta, Management, Industries, North America, Alaska.
Identifiers: Commercial fishing, Noctiluca, Gonyaulax.

Information on the impact of dinoflagellate blooms on the shellfish industry exists primarily in the form of government statistics and tables. As such tables generally summarize disastrous situations, included data yield a somewhat distorted picture of the economic problems which such blooms create. In addition, economic losses to the industry are seldom reported as a percentage of the entire industry on a year-to-year basis. The purpose of this workshop is to define the social, economic, and management problems which are created by toxic dinoflagellate blooms in various regions of North America. This report concentrates on the current and potential industry impacts. Since accurate economic analyses are not available, these comparisons must still be made on a relative scale.

UR-3490-1581 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY.
Hybridization with Synthetic Oligonucleotides.
J. W. Szostak, J. I. Stiles, B. K. Tye, F. Sherman, and R. Wu. 1978, 17p
Contract EY-76-C-02-3490

Descriptors: *Escherichia coli, *Genes, *Nucleotides, *Probes, *Yeasts, Cloning, DNA, Genetics, *Hybridization, Proteins, RNA, Sensitivity, Specificity.
Identifiers: ERDA/550400, *Oligonucleotides, Deoxyribonucleic acids.

For abstract, see ERA citation 04:041720.

6E. Clinical Medicine

AD-A070 512/9GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Influenza Alone and in Sequence with Pneumonia Due to 'Streptococcus pneumoniae' in the Squirrel Monkey,
Richard F. Berendt, G. G. Long, and J. S. Walker. 28 Mar 75, 5p
Availability: Pub. in Jnl. of Infectious Diseases, v132 n6 p689-693 Dec 75 (No copies furnished by DDC).

Descriptors: *Influenza virus, *Streptococcal pneumonia, *Pneumonia, Diagnosis(Medicine), Respiratory diseases, Exposure(Physiology), Reprints.
Identifiers: Monkeys, Laboratory animals.

No abstract available.

AD-A070 513/7GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Initial Clinical Evaluation of a New Rocky Mountain Spotted Fever Vaccine of Tissue Culture Origin,
Michael S. Ascher, Charles N. Oster, Philip I. Harber, Richard H. Kenyon, and Carl E. Pedersen, Jr. 14 Sep 77, 5p
Grant PHS-2-YOI-AI-70006-00
Availability: Pub. in Jnl. of Infectious Diseases, v138 n2 p217-221 Aug 78 (No copies furnished by DDC).

Descriptors: *Vaccines, *Rickettsia rickettsii, Fevers, Tissue culture, Models, Reprints.
Identifiers: *Rocky Mountain Spotted Fever.

No abstract available.

AD-A070 514/5GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Pathogenesis of Respiratory 'Klebsiella pneumoniae' Infection in Rats: Bacteriological and Histological Findings and Metabolic Alterations,
R. F. Berendt, G. G. Long, F. B. Abeles, P. G. Canonico, and M. R. Elwell. 18 Jun 76, 8p
Availability: Pub. in Infection and Immunity, v15 n2 p586-593 Feb 77 (No copies furnished by DDC).

Descriptors: *Klebsiella pneumoniae, Pathogenesis, *Respiratory diseases, Lung, Laboratory tests, Metabolism, Reprints.
Identifiers: Histology, Infections, Rats, Laboratory animals, Bacteria.

No abstract available.

AD-A070 515/2GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Pneumocystis carinii' Infection in Splenectomized Owl Monkeys,
Gerald G. Long, John D. White, and James L. Stookey. 1975, 4p
Availability: Pub. in Jnl. of the American Veterinary Medical Association, v167 n7 p651-654, 1 Oct 75 (No copies furnished by DDC).

Descriptors: *Pneumonia, Diagnosis(Medicine), Parasites, Respiratory system, Lesions, Owl monkeys, Reprints.
Identifiers: Pneumocystis carinii.

No abstract available.

AD-A070 516/0GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Selective Clearance of a Benign Clone of Venezuelan Equine Encephalitis Virus from Hamster Plasma by Hepatic Reticuloendothelial Cells,
Peter B. Jahrling, and Leo Gorelkin. 8 May 75, 8p
Availability: Pub. in Jnl. of Infectious Diseasess, v132 n6 p667-676 Dec 75 (No copies furnished by DDC).

Descriptors: *Venezuelan equine encephalomyelitis virus, Virus diseases, Cells(Biology), Strains(Biology), Hamsters, Blood analysis, Adsorption, Test methods, Vaccines, Reprints.

No abstract available.

AD-A070 517/8GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Studies on 'Macaca mulatta' Infected with Rocky Mountain Spotted Fever,
Lenora S. Sammons, Richard H. Kenyon, Gary T. Burger, William R. Beisel, and Carl E. Pedersen, Jr. 16 Sep 76, 4p
Availability: Pub. in American Jnl. of Veterinary Research, v38 n6 p907-910 Jun 77 (No copies furnished by DDC).

Descriptors: *Rickettsia rickettsii, *Infectious diseases, Fevers, Blood analysis, Rickettsial antibodies, Test methods, Clinical medicine, Reprints.
Identifiers: *Rocky Mountain Spotted Fever, Macaca mulatta, Laboratory animals, Monkeys.

No abstract available.

AD-A070 520/2GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD

Evaluation of Vascular Clearance as a Marker for Virulence of Alphaviruses: Disassociation of Rapid Clearance with Low Virulence of Venezuelan Encephalitis Virus Strains in Guinea Pigs.
Peter B. Jahrling, Gregory B. Heisey, and Richard A. Hesse. 13 Jan 77, 5p
Availability: Pub. in Infection and Immunity, v17 n2 p356-360 Aug 77 (No copies furnished by DDC).

Descriptors: *Venezuelan equine encephalomyelitis virus, Strains(Biology), Guinea pigs, Vaccines, Pathology, Reprints.
Identifiers: Laboratory animals, *Viruses.

No abstract available.

AD-A070 521/0GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Response of Influenza Virus-Infected Mice to Selected Doses of Ribavirin Administered Intraperitoneally or by Aerosol,
R. F. Berendt, J. S. Walker, J. W. Dominik, and E. L. Stephen. 24 Jan 77, 2p
Availability: Pub. in Antimicrobial Agents and Chemotherapy, v11 n6 p1069-1070 Jun 77 (No copies furnished by DDC).

Descriptors: *Influenza virus, *Biological aerosols, Pharmacokinetics, Dose rate, Mice, Therapy, Exposure(Physiology), Reprints.
Identifiers: *Ribavirin, *Drug therapy.

No abstract available.

AD-A070 522/8GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Susceptibility of Laboratory Animals to Infection by Spotted Fever Group Rickettsiae,
Lenora S. Sammons, Richard H. Kenyon, Robert L. Hickman, and Carl E. Pedersen, Jr. 1 Feb 77, 6p
Availability: Pub. in Laboratory Animal Science, v27 n2 p229-234 Apr 77 (No copies furnished by DDC).

Descriptors: *Rickettsia, *Vaccines, Antigens, Laboratory animals, Models, Test methods, Fevers, Guinea pigs, Reprints.
Identifiers: Spotted fever.

No abstract available.

AD-A070 542/6GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Prompt Confirmation of Rocky Mountain Spotted Fever: Identification of Rickettsiae in Skin Tissues,
T. E. Woodward, C. E. Pedersen, Jr., C. N. Oster, L. R. Bagley, and J. Romberger. 6 Jul 76, 6p
Availability: Pub. in the Jnl. of Infectious Diseases, v134 n3 p297-301 Sep 76 (No copies furnished by DDC).

Descriptors: *Rickettsia rickettsii, Fevers, Skin tests, Diagnosis(Medicine), Serodiagnosis, Tissue culture, Identification, Reprints.
Identifiers: *Rocky Mountain Spotted Fever.

No abstract available.

AD-A070 544/2GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Renal Carcinoma in a Dog,
George E. Eyster, William Weber, William McQuillan, John D. White, and G. T. Burger. 1977, 2p
Availability: Pub. in JAVMA, v171 n3 p282-283, 1 Aug 77. (No copies furnished by DDC).

Descriptors: *Neoplasms, *Kidneys, Diagnosis(Medicine), Pathology, Dogs, Cells(Biology), Reprints.
Identifiers: *Renal carcinoma, Laboratory animals.

No abstract available.

AD-A070 551/7GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Inactivated Venezuelan Equine Encephalomyelitis Virus Vaccine Complexed with Specific Antibody: Enhanced Primary Immune Response and Altered Pattern of Antibody Class Elicited,
William E. Houston, Robert J. Kremer, Caroll L. Crabbs, and Richard O. Spertzel. 28 Jun 76, 11p
Availability: Pub. in the Jnl. of Infectious Diseases, v135 n4 p600-610 Apr 77 (No copies furnished by ddc).

Descriptors: *Venezuelan equine encephalomyelitis virus, *Vaccines, Antigen antibody reactions, Immunization, Test methods, Reprints.
Identifiers: Immune responses.

No abstract available.

AD-A070 553/3GA Not available NTIS
California Univ Berkeley Naval Biosciences Lab
RNA Synthesized in Calicivirus-Infected Cells is Atypical of Picornaviruses,
D. W. Ehresmann, and F. L. Schaffer. 11 Nov 76, 6p
Availability: Pub. in Jnl. of Virology, v22 n2 p572-576 May 77 (No copies furnished by DDC).

Descriptors: *Viruses, *Ribonucleic acids, Cells(Biology), Purification, Medical research, Reprints.
Identifiers: *Picornaviruses, *Calicivirus.

No abstract available.

AD-A070 683/8GA Not available NTIS
Naval Medical Research Unit No 2 APO San Francisco 96263
Oral Infection in Paediatric Salmonellosis,
Warren R. Sanborn, Murad Lesmana, and Koesno. 1976, 1p Rept no. NAMRU-2-TR-739
Availability: Pub. in The Lancet, p478 28 Aug 76. (No copies furnished by DDC).

Descriptors: *Salmonellosis, *Oral diseases, Medical examination, Nursing, Test methods, Oral health, Pediatrics, Infants, Reprints.
Identifiers: Infections.

No abstract available.

AD-A070 688/7GA Not available NTIS
State Univ of New York at Buffalo Dept of Physiology
Narcotic Potency of N2, A, and N2O Evaluated by the Physical Performance of Mouse Colonies at Simulated Depths,
H. Rahn, and M. A. Rokitka. Sep 75, 10p
Contract N00014-71-C-0342
Summary in French.
Availability: Pub. in Undersea Biomedical Research, v3 n1 p25-34 Mar 76 (No copies furnished by DDC).

Descriptors: *Narcosis, *Performance tests, Narcotics, Behavior, Mice, Physiological effects, Nitrogen, Biological rhythms, Hyperbaric conditions, Tables(Data), Reprints.
Identifiers: Laboratory animals.

No abstract available.

AD-A070 689/5GA PC **A02**/MF **A01**
School of Aerospace Medicine Brooks AFB TX
Vasovagal Syncope in Aircrew: Psychosocial Aspects,
William H. Sledge, and James A. Boydstun. 1977, 12p Rept no. SAM-TR-77-364
Pub. in Jnl of Nervous and Mental Disease, v167 n2 p114-124 1979.

Descriptors: *Syncope, *Diagnosis(Medicine), Flight crews, Personality tests, Aviation personnel, Reprints.
Identifiers: Social psychology.

No abstract available.

AD-A070 736/4GA PC **A02**/MF **A01**
Defence Research Establishment Suffield Ralston (Alberta)
The Efficacy of Therapy at Doses Suggested for Self-Aid against GD Poisoning.
Technical paper,
J. A. Lipp. Apr 79, 14p Rept no. DRES-TP-497

Descriptors: *Anticonvulsants, Physiological effects, Self treatment, Drug tolerance, GD agent, Convulsive disorders, Atropine, Poisoning.
Identifiers: Clonazepam, Monkeys, Laboratory animals.

Monkeys were exposed to 1 LD50 of GD and treated with a combination of clonazepam, atropine and toxogonin at doses suggested for self-aid. The doses used were based on equivalent human doses of 2 mg/man of atropine, 5 mg/man of clonazepam and 280 mg/man of toxogonin. This therapy, given by intramuscular injection when the initial signs of poisoning occurred, adequately suppressed the abnormal EEG and muscular activity. Atropine reversed cardiac arrhythymia, but the GD-induced respiratory depression and bradycardia appeared more resistant and in some animals additional atropien was necessary. Control animals that only received therapy did not appear to be incapacitated. The results of this study suggest that this therapy would produce a degree of protection against GD poisoning and could be used as self-aid. (Author)

AD-A070 743/0GA PC **A03**/MF **A01**
Texas Univ at Austin Dept of Microbiology
Purification and Mode of Action of a Subcellular Fraction from a Salmonella-Derived Ribosomal Vaccine.
Final rept. 1 Jan 74-31 Aug 75,
L. Joe Berry. 29 Nov 76, 31p
Contract DAMD17-74-C-4049

Descriptors: *Vaccines, *Ribosomes, Purification, Laboratory procedures, Salmonella typhimurium, Immunogens, Mice, Toxicity.
Identifiers: *Ribosomal vaccines, Subcellular vaccines, Ammonium chloride, *Bacteria.

This report discusses the evidence for an extrinsic immunogen in effective ribosomal vaccines from Salmonella typhimurium. Ribosomes isolated from Salmonella typhimurium and the RNA derived from them are highly immunogenic against homologous challenge. Ribosomes washed repeatedly in 1 M NH4Cl lost prophylactic potency and yielded poorly protective RNA. The high salt wash was immunogenic as were the RNA and the protein isolated from the wash. No intrinsic component of ribosomes was removed by the NH4Cl wash, since the ability of both 'crude' and 'clean' ribosomes to function equally well in an in vitro protein synthesizing system was demonstrated. A component with toxic properties similar to those of endotoxin was found in active vaccines but not in weak ones.

AD-A070 790/1GA PC **A02**/MF **A01**
Hawaii Univ Honolulu Dept of Food and Nutritional Sciences
Kidney Stone Prevention.
Final rept. 1 Nov-31 Mar 79,
Robert Van Reen. 24 May 79, 14p
Contracts N00014-67-A-0387-0011, N00014-75-C-0357

Descriptors: *Kidney diseases, Phosphates, Kidney function tests, Bladder(Urinary), Children, Diet, *Preventive medicine, Patients.
Identifiers: *Stone diseases, Thailand, Pakistan, Egypt, Nutrition.

Idiopathic urinary bladder stone disease was studied in children living in Thailand, Pakistan, and Egypt. In Thailand the approach taken was to study subjects living in endemic and non-endemic stone areas to determine nutritional and biochemical differences between the two populations. In Egypt and Pakistan, patients with bladder stone disease were compared to subjects of the same age without stones. (Author)

AD-A070 868/5GA PC **A02**/MF **A01**
Naval Blood Research Lab Boston MA
Occurrence of HBsAg, Anti-HBs, and Anti-CMV Following the Transfusion of Blood Products,
Thomas J. Contreras, David J. Lang, Linda E. Pivacek, and C. Robert Valeri. 17 Apr 78, 10p
Pub. in Transfusion, v19 n2 p129-136 Mar-Apr 79.

Descriptors: *Blood analysis, *Infectious hepatitis virus, Blood transfusion, Diagnosis(Medicine), Erythrocytes, Blood preservation, Reprints.

No abstract available.

AD-A070 871/9GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC

Studies on Immunity to Alphaviruses in Foals,
James A. Ferguson, William C. Reeves, and James L. Hardy. 12 Jul 76, 8p
Pub. in American Jnl. of Veterinary Research, v40 n1 p5-10 Jan 79.

Descriptors: *Immunity, *Viruses, Antibodies, Venezuelan equine encephalomyelitis virus, Western equine encephalomyelitis virus, Eastern equine encephalomyelitis virus, Vaccines, Reprints.
Identifiers: *Alphaviruses, Horses.

No abstract available.

AD-A070 883/4GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Lymphocyte Cryopreservation for Histocompatibility Testing.
Medical research progress rept.,
Douglas M. Strong, Robert J. Hartzman, and Jimmie A. Light. May 78, 7p Rept no. NMRI-78-115
Pub. in Dialysis and Transplantation, v7 n5 p513-516 May 78.

Descriptors: *Lymphocytes, *Cryogenics, *Preservation, Histological techniques, Compatibility, Freezing, Thawing, Reprints.
Identifiers: *Histocompatibility testing, Cryopreservation.

No abstract available.

AD-A070 891/7GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
NAMES III Executive Summary.
Interim rept. Dec 77-May 79,
Paul B. Richards. May 79, 22p Rept no. NRL-MR-4001

Descriptors: *Medical evacuation, Computerized simulation, Systems analysis, Medical services, Emergencies, Casualties, Logistics planning, Flow charting, Aeromedical evacuation, Amphibious operations, Military medicine, Naval research.
Identifiers: *NAMES-3 computer program.

The Naval Research Laboratory NAMES III (Navy Amphibious Medical Evacuation Simulation) Model is a computer program which simulates the operation of multi-echelon medical treatment and evacuation systems. NAMES III tracks the flow of each combat casualty from the Forward Edge of the Battle Area (FEBA) through the Combat Zone, through the Communications Zone (COMMZ) and into and through the Continental United States (CONUS). NAMES III is a capabilities model, designed to assist the Armed Forces in the development of wartime medical support planning and patient management. User inputs for NAMES III include the patient work load, medical personnel and materiel resources, evacuation resources including ambulances, helicopters, and fixed-wing aircraft, as welll as the configuration of the complete medical treatment and evacuation system. Outputs of NAMES III include patient dispositions, including mortalities, measures of morbidity, and the number of patients returned to duty. Measures of resource utilization, short comings and efficiency are also obtained as output from the model. The purpose of the Executive Summary is to provide new and prospective users a general overview of the model and its capabilities. Information necessary to effectively use the NAMES III program is contained in the User's Manual, NRL Instruction Book 172.

AD-A070 920/4GA PC **A04**/MF **A01**
Academy of Health Sciences (Army) Fort Sam Houston TX Health Care Studies Div
Assessment of Consumer Health Education Needs of DeWitt MEDDAC, Fort Belvoir, Virginia.
Final rept. Oct 74-Mar 75,
Deloros H. Kucha. Mar 75, 52p Rept no. HCSD-79-001-A

Descriptors: *Patients, Health, Education, Health care facilities, Hospitals, Military facilities, Teaching methods, Medical personnel, Military dependents, Active duty, Army personnel, Public health, Illness, Consumers.
Identifiers: PACOMED project, Patient education, Chronic diseases, *Health education, *Health consumers.

The purpose of the survey was to assess the consumer health education needs of the DeWitt MEDDAC, Fort Belvoir, Va. Objectives were: to identify current patient education programs; to determine educational methodologies used for current patient education programs; to determine resources, both technological and personnel, used for current patient education programs; to systematically identify local consumer health education needs from input by both health care providers and patient consumers; to select topic areas to be addressed for the PACOMED study from the outcomes of the assessment. The sample consisted of 20% of the professional staff, 200 Family Practice and Acute Minor Illness Clinic Consumers and 147 potential patient consumers from the housing developments on Post. Major conclusions were: the methods used and the completeness of the sampling varied considerably and does not necessarily support generalizations into other situations; the patient and community education needs selected from the outcomes of the assessment were: hypertension, diabetes, weight control, family planning, vaginitis, breast self examination, child growth and development, and eye problems. In addition the data indicated a need for validated patient instructional strategies with scientific assessment tools, a learning center for patients, technological resources, leadership and 'know-how' in the area of consumer health education.

AD-A070 921/2GA PC **A99**/MF **A01**
Academy of Health Sciences (Army) Fort Sam Houston TX Health Care Studies Div
Strategy for Instructional Systems Design and Formative Evaluation.
Final rept. Jul 75-Jul 76,
Deloros H. Kucha. Jul 76, 652p Rept no. HCSD-79-001-B

Descriptors: *Patients, Health, Education, Systems analysis, Health care facilities, Hospitals, Military facilities, Teaching methods, Instructional materials, Audiovisual aids, Cost analysis, Medical personnel, Military dependents, Army personnel, Illness, Active duty, Public health, Learning, Consumers.
Identifiers: PACOMED Project, *Patient education, Chronic diseases, *Health education.

The overall purpose of the study was to deal with the elements of a systems model for designing patient education modules in eight areas (hypertension, diabetes, weight control, breast self-examination, vaginitis, family planning, child growth and development, and low back pain). The event identification of the system approach that was used consisted of: (1) topic selection; (2) task analysis; (3) development of behavioral objectives; (4) 'real world' search for existing educational software; (5) evaluation of existing educational software; (6) development of criterion measures; (7) design of the instructional system; (8) formative evaluation; (9) data collection; (10) revision; (11) physician evaluation; (12) cost analysis; (13) and final staff evaluation. Examples are given for each of the eight patient education areas, in addition to the enlisted health educator's functions, system narratives, and data collection sheets. Also addressed was the evaluation of several types of educational hardware used to carry the audiovisual presentations and the effectiveness of each. (Author)

AD-A070 922/0GA PC **A11**/MF **A01**
Academy of Health Sciences (Army) Fort Sam Houston TX Health Care Studies Div
A Patient Learning Center for an Army MEDDAC - A Feasibility Study.
Final rept. Jul-Dec 77,
Deloros H. Kucha. Dec 77, 247p Rept no. HCSD-79-001-C

Descriptors: Patients, Health, Education, Health care facilities, Hospitals, Military facilities, Site selection, Instructors, Medical personnel, Army personnel, Military dependents, Active duty, Illness, Instructional materials, Learning, Consumers, Systems analysis.
Identifiers: PACOMED Project, *Patient education, Paramedical personnel, Chronic diseases, *Health education, Feasibility studies.

The purposes of the study were to examine in detail, analyze, and describe the development and operation (system effectiveness and efficiency) of a patient learning center in a MEDDAC. The overall objective was to ascertain the feasibility of a patient learning center for a MEDDAC. The specific objectives were: to develop and describe the physical facilities; to describe the selection of the communications media; to develop, describe, and evaluate the role of a para-professional as learning laboratory technician; to develop, describe, and evaluate a professional referral system; to document the professional and consumer user's response to the systems approach in a prototype patient education setting; to develop, describe, and evaluate a self-referral system; to describe and analyze the outcomes of eight learning systems (hypertension, diabetes, weight control, breast self-examination, low back pain, vaginitis, family planning, child growth and development). The report documents experiences gained and problems encountered for the year of operation, August 1976 - July 1977. The attempts made to resolve problems are discussed and appropriate suggestions or recommendations made. The type of data collected is included and may prove useful as a source of information for those contemplating establishing a patient learning center.

AD-A070 923/8GA PC **A09**/MF **A01**
Academy of Health Sciences (Army) Fort Sam Houston TX Health Care Studies Div
A Comparative Evaluation of the Traditional versus a Systems Approach for Hypertensive Patient Education.
Final rept. Sep 74-Dec 77,
Deloros H. Kucha. Aug 77, 178p Rept no. HCSD-79-001-D

Descriptors: Patients, Health, Education, Systems management, Hypertension, Medical services, Medical personnel, Cost effectiveness, Health care facilities, Learning, Teaching methods, Army personnel, Active duty, Military dependents, Consumers, Acceptability, Cost analysis.
Identifiers: PACOMED project, *Patient education, Chronic diseases, Comparison, *Systems approach, *Health education.

The purpose of the investigation was to evaluate the traditional method (physician, nurse) versus a systems approach method of providing health education. The objectives were: to identify cost-effective and feasible ways of delivering patient education; to guarantee an important resource for the professional in fulfilling his/her patient education responsibilities with economy and efficiency; to help minimize the medical workload; to assure medical accountability in the patient education area; to improve medical management; to decrease patient recidivism; to enhance patient satisfaction; to assist the patient consumer to be an effective self-care agent. The sample consisted of 502 diagnosed adult essential hypertensive patients derived from the active duty, retired, and dependent population of two outpatient clinics. A two-group experimental design was used. Personal characteristics, measures of comprehension and retention, measures of compliance behavior, locus of control, and reading level were the main categories of patient variables. Major conclusions were that all of the data indicated a need for a more effective, efficient, cost-effective method of providing patient education than now exists in the AMEDD health care delivery system. More specifically, this study demonstrated and effectiveness of the systems approach methodology in the areas of comprehension, retention, behavioral compliance, and cost-effectiveness. (Author)

AD-A070 924/6GA PC **A04**/MF **A01**
Academy of Health Sciences (Army) Fort Sam Houston TX Health Care Studies Div
Cost/Benefit Analysis of Competing Patient Education Systems.
Final rept. Aug 75-Oct 77,
Dale L. Williams. 28 Oct 77, 53p Rept no. HCSD-79-001-E

Descriptors: Patients, Health, Education, Cost analysis, Benefits, Instructional materials, Instructors, Medical services, Medical personnel, Cost effectiveness, Manpower utilization, Active duty, Army personnel, Military dependents, Consumers.
Identifiers: PACOMED project, *Patient education, Paramedical personnel, *Health education, Benefit cost analysis.

The purpose of this study was to determine the best of three methods of administering patient education based on both cost and benefits. The two objectives were to perform a cost/benefit

analysis (CBA) on the various approaches to administering patient education, and to make a recommendation based on the outcome of the CBA concerning the adaption of the winning alternatives. The conclusion of this analysis was that the PACOMED system is the best alternative based on cost and benefits.

AD-A070 978/2GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
The Influence of Alpha-Fetoprotein on Moloney Sarcoma Virus Oncogenesis: Evidence for Generation of Antigen Nonspecific Suppressor T Cells.
Medical research progress rept.,
M. Eric Gershwin, James J. Castles, Aftab Ahmed, and Ronald Makishima. 8 Jun 78, 10p Rept no. NMRI-78-113
Pub. in Jnl of Immunology, v121 n6 p2292-2298 Dec 78.

Descriptors: *Neoplasms, *Viruses, Cells(Biology), Antigens, Cancer, Suppression, Reprints.
Identifiers: *Alpha-Fetoprotein.

No abstract available.

AD-A070 981/6GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Kidney Transplantation in the Army Medical Department.
Medical research progress rept.,
J. A. Light, C. R. Annable, M. R. Alijani, M. H. Goldman, and D. M. Strong. 1979, 9p Rept no. NMRI-79-8
Pub. in Military Medicine v144 n4 p217-222 Apr 79.

Descriptors: *Surgical transplantation, *Kidneys, Army research, Military medicine, Hospitals, Medical research, Navy, Reprints.

No abstract available.

AD-A070 982/4GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Genetic Requirements for Bone Marrow Transplantation for Stem-Cell-Defective W/Wv Mice.
Medical research progress rept.,
S. J. Sharkis, R. Cahill, A. Ahmed, W. W. Jedrzejczak, and K. W. Sell. 1979, 8p Rept no. NMRI-79-9
Pub. in Transplantation Proceedings, v11 n1 p511-516 Mar 7I9.

Descriptors: *Transplantation, *Bone marrow, Hemopoietic cells, *Genetics, Requirements, Compatibility, Mice, Reprints.

No abstract available.

AD-A070 988/1GA PC **A03**/MF **A01**
Maryland Univ College Park Dept of Microbiology
Studies on Typhus and Spotted Fever.
Annual progress rept. 1 Jul 77-30 Jun 78,
Charles L. Wisseman, Jr. Feb 79, 48p
Contract DADA17-71-C-1007

Descriptors: *Typhus, Rickettsia, Immunity, Medical research, Fevers, Rickettsia prowazekii, Genetics, Deoxyribonucleic acids.
Identifiers: *Spotted fevers, *Rickettsial diseases.

Rickettsial preparations were enriched for viability by density gradient centrifugation. The genome size of typhus group rickettsiae, Rochalimaea quintana, Baker's vole agent and R. rickettsii was found to be about 1 x 10 to 9th daltons. Hybridization techniques verified clusters of strains of R. mooseri but that the two groups were clearly different from each other and from R. rickettsii and Rochalimaea quintana. Baker's vole agent, suggested by others to be a strain of R. quintana, was found to be distinct by DNA homology and SDS-PAGE profiles of proteins.

AD-A071 007/9GA PC **A02**/MF **A01**
Army Inst of Dental Research Washington DC
Oral Manifestations of Tropical Infectious Diseases of Central and South America. Part I. Protozoan and Helminthic Infections.
Rept. for Feb 78-May 79,
Theodore Zislis, James C. Adrian, and Duane E. Cutright. 24 May 79, 18p
Prepared in cooperation with Armed Forces Inst. of Pathology, Washington, DC.

Descriptors: *Tropical diseases, Literature surveys, *Protozoa, *Helminthic diseases, Bacterial diseases, Fungus diseases.
Identifiers: *Infectious diseases.

Oral manifestations of tropical infectious diseases are seldom discussed extensively in most current textbooks of oral diagnosis or oral pathology. This paper is the result of a survey of literature in which the oral manifestations of infectious diseases of particular significance to Latin America have been described. In addition to emphasizing the oral manifestations, the major clinical and therapeutic aspects of each disease are also discussed in this two-part paper. Part 1 features protozoal and helminthic diseases and Part II features bacterial and mycotic infections. (Author)

AD-A071 009/5GA PC **A02**/MF **A01**
Army Inst of Dental Research Washington DC
The Effects of EDTA and Sonication on the Disaggregation of Oral Bacteria.
Rept. for 13 Feb 77-15 May 79,
Michael B. Dayoub, and Charles E. Hawley. 14 Jun 79, 23p
Includes 5 charts.

Descriptors: *Oral bacteria, Dental plaque, Separation, Microorganisms, Ultrasonic tests.
Identifiers: Disaggregation, *EDTA, *Sonication.

The dispersive effects of EDTA and ultrasound on bacterial aggregates in an anaerobic environment was studied. Pooled supragingival plaque samples were placed into reduced transport fluid containing 0.0M, .001M, .01M, or 0.1M EDTA and colony forming units were dispersed and cultured at 37C for 72 hours. Mean colony forming units were increased 42.7% and 54.4% respectively in 1 mM and 10 mM concentrations of EDTA and decreased when plaque was dispersed in 100 mM concentrations of EDTA. Fusobacterium nucleatum was grown in broth culture, placed into reduced transport fluid containing no chelating agent, and sonicated for 0, 5, 15, or 30 seconds. Sonication at the lowest power setting produced a statistically significant ($p < .01$) increase in CFU after 5 seconds but did not cause significant changes in CFU up to 15 seconds. The effect of sonication at medium or high power settings was variable, and factors affecting variability are discussed. (Author)

AD-A071 064/0GA PC **A02**/MF **A01**
Army Inst of Dental Research Washington DC
Criteria for Successful Composite Restorations.
Rept. for Feb-Jun 79,
Lewis Lorton, and John Brady. 13 Jun 79, 16p

Descriptors: *Dentistry, *Oral health, *Dental prostheses, Dental caries, Etching, Military medicine, Teeth.
Identifiers: Dental materials.

Composite resin restorations, while not as munipulation-sensitive as some other restorative materials, must be handled correctly for maximum adaptation, and marginal seal. This article discusses criteria for cavity finishing, marginal form, etching, and dentin protection which are vital for success. (Author)

AD-A071 071/5GA PC **A03**/MF **A01**
Georgetown Univ Washington DC Lombardi Cancer Center
Immunoregulation to Facilitate Transplantation and Reparative Surgery: Development of Natural Biological Agents.
Annual rept.,
Allan H. Smith, and Philip L. Calcagno. 15 Jun 79, 29p Rept no. TR-2
Contract N00014-77-C-0748

Descriptors: *Immunology, *Transplantation, Antigen antibody reactions, Immunity, Response(Biology).
Identifiers: *Immunoregulation.

Methods are being developed to allow us to identify given antigen specific clones of cells by using antibodies against the cell surface receptors for that antigen. This technique will allow us to specifically delete clones of harmful cells, as in the case of graft versus host disease producing cells in the bone marrow transplant situation, or stimulate the specific clones of cells required for protective immunity against certain pathogens. Over the past year we have been able to show in animal systems, that antibodies can be prepared against cell receptors for histocompatibility antigens, and specific clones depleted. Other work characterizing cell surface receptors on human cells, has shown that they are coded for by the same genes that code for immunoglobulin antigen binding sites (variable regions genes).

AD-A071 098/8GA PC **A03**/MF **A01**
Army Inst of Dental Research Washington DC
Evaluation of Prophylactic Alveolar Trephination: To Avoid Pain.
Donald D. Peters. 22 Jun 79, 32p
Includes envelope containing 14 pictures.

Descriptors: *Dental surgery, *Pain, Therapy, Control.
Identifiers: *Trephination, *Prophylaxis.

The purpose of this paper was to evaluate the general use of trephination for avoidance of post-treatment endodontic pain. Also to determine if its more frequent use would allow more rapid completion of endodontic treatment. Two hundred and twenty-five teeth were filled after one or two appointments. Fifty one-appointment fills were trephined and 50 not trephined, unless they experienced severe pain. One hundred and twenty-five teeth were filled at the second appointment and only those experiencing severe pain were trephined. The one-appointment not trephined had a 16% incidence of pain while the two-appointment had a 9.6% incidence of pain. Sixty-nine of 70 cases of trephination were asymptomatic. Statistical analysis showed the increase in pain when trephination wasn't used was significant (98% level), yet its value as a prophylactic procedure was discussed and questioned. (Author)

AD-A071 120/0GA PC **A03**/MF **A01**
Georgetown Univ Washington DC Lombardi Cancer Center
Histocompatibility Typing.
Technical rept.,
Paula Romano, and Philip L. Calcagno. 15 Jun 79, 47p Rept no. TR-2
Contract N00014-77-C-0747

Descriptors: *Histological techniques, Tissues(Biology), Compatibility, Transplantation.
Identifiers: *Histocompatibility typing, Cell typing, B cells.

Improvements have been made in HLA-D typing. These improvements include advances in homozygous typing cell typing, primed lymphocyte typing and the utilization of these reagents and methods in parallel test systems. First the efficiency of performing and analyzing homozygous typing cell (HTC) experiments has been increased. Second, additional homozygous typing cells of both known specificity and previously undefined type have been obtained. Several important developments in primed lymphocyte typing (PLT) have been made. Finally the techniques and reagents developed by this contract have led to advances in parallel research areas. Homozygous typing cells and HLA-D typed panel were used to determine the association of certain HLA specificities and level of peripheral blood cytotoxic lymphocytes. The primed lymphocytes technique has been used to identify a new potential role for interferon in clinical transplantation. And homozygous typing cells have been transformed into B-cell lines for use as standard reagents in the identification of B-cell antisera.

AD-A071 142/4GA PC **A08**/MF **A01**
Pan American Health Organization Washington DC
Vectors and Natural Reservoirs of Oropouche Virus in the Amazon Region.
Final rept. 1 Nov 77-30 Oct 78,
James W. LeDuc, A. Lynn Hoch, Francisco De P. Pinheiro, Norman E. Peterson, and Karl A. Western. Dec 78, 165p
Grant DAMD17-78-G-9442

Descriptors: *Viruses, *Virus diseases, *Culicoides, Ecology, Epidemiology, Hosts(Biology), Serology, Mammals, Birds, Humans.
Identifiers: *Oropouche viruses, *Culicoides paraensis, *Disease vectors.

Current efforts attempt to elucidate the endemic and epidemic cycles of Oropouche (ORO) virus. This virus cause disease in man generally of about 7 days duration, with some patients severely ill, occasionally to the point of prostration. This disease has been reported to cause large scale epidemics in urban areas of northern Brazil. Accomplishments included in this report with regard to ORO virus have been divided into two major categories; studies on the epidemic cycle, and studies on the endemic cycle. Under the category studies on the epidemic cycle, conclusive data are presented which establish the midge, Culicoides paraensis, as the primary epidemic vector of ORO virus. Subsequent sections present results of investigations of the basic biology of this midge. A second section of studies on the epidemic cycle of ORO virus deals with man as the principal vertebrate host in the epidemic cycle. Here evidence is presented which indicates that, when infected, man circulates ORO virus in sufficient titer to infect feeding C. paraensis. Finally, results of an epidemic of ORO virus disease which occurred in and around Tome, Acu, Para, Brazil are reported.

AD-A071 145/7GA PC **A03**/MF **A01**
Georgetown Univ Washington DC Lombardi Cancer Center
Histocompatibility Typing.
Annual rept.,
Paula Romano, and Philip L. Calcagno. 15 Jun 79, 50p Rept no. TR-2
Contract N00014-77-C-0747

Descriptors: *Histological techniques, *Transplantation, Tissues(Biology), Compatibility, Identification, Interferon, Bone marrow.
Identifiers: *Histocompatibility typing, Cell typing, B cells.

Major qualitative and quantitative improvements have been made in HLA-D typing. These improvements include advances in homozygous typing cell typing, primed lymphocyte typing and the utilization of these reagents and methods in parallel test systems. First the efficiency of performing and analyzing homozygous typing cell (HTC) experiments has been increased. Second, additional homozygous typing cells of both known specificity and previously undefined type have been obtained. The selection of this laboratory as one of fourteen major HLA-D typing laboratories by the Eighth International Histocompatibility Workshop demonstrates our current international recognition and will assure our continued leadership in this area. Several important developments in primed lymphocyte typing (PLT) have been made. Finally the techniques and reagents developed have led to advances in parallel research areas. Homozygous typing cells and HLA-D typed panel were used to determine the association of certain HLA specificities and level of peripheral blood cytotoxic lymphocytes. The primed lymphocytes technique has been used to identify a new potential role for interferon in clinical transplantation. Homozygous typing cells have been transformed into B-cell lines for use as standard reagents in the identification of B-cell antisera.

AD-A071 147/3GA PC **A03**/MF **A01**
Louisiana State Univ Shreveport Dept of Physiology and Biophysics
Predictability of Burn Depth: Data Analysis and Mathematical Modeling Based on U. S. Army Aeromedical Research Laboratory's Experimental Porcine Burn Data.
Annual Summary Rept. 1 Oct 76-14 Jun 77,
Francis S. Knox, III, and Ransom A. Nockton. Jul 77, 47p
Contract DAMD17-77-C-7004

Descriptors: *Burns(Injuries), *Skin(Anatomy), *Protective clothing, *Mathematical models, Data bases, Mathematical prediction, Tissues(Biology), Experimental data, Thermal radiation, Radiation protection, Fabrics, Swine, Damage.
Identifiers: Laboratory animals.

Additional burn data from experiments conducted at the University of Rochester were obtained, reread and are ready to be added to the data base. Burn depths corrected for shrinkage can be 46% deeper in dermal burns. thermal data (e.g. heat flux) recorded on FM tape during the experiments at USAARL was redigitized in preparation for calculation of thermal input to the skin. The effect of ambient temperature on pig skin temperature was studied to see if skin temperatures could be calculated knowing ambient temperature. The effects of anesthesia and humidity on this relationship have yet to be included. refinement of a preliminary empirical model awaits the heat flux data now resident on the digital tapes. Sections of an analytical model employing Crank-Nicholson differencing techniques are runnable on computers using FORTRAN IV. Further development of the analytical model awaits the finalization of the burn base.

AD-A071 180/4GA PC **A04**/MF **A01**
Yale Univ New Haven CT School of Medicine
Mechanism of Innate Resistance to Flaviviral Encephalitis.
Annual rept. 1 Mar 75-31 Dec 76,
Robert O. Jacoby, and Pravin N. Bhatt. Dec 76, 56p
Contract DAMD17-74-C-4060

Descriptors: *Encephalitis, *Immunity, Resistance(Biology), Genetics, Pathogenesis, Mice, Immunosuppression, Cytotoxin.
Identifiers: *Flaviviral encephalitis.

Immunological factors that influence the phenotypic expression of genetic resistance or susceptibility to lethal flavivirus infection were investigated in 2 congenic strains of mice: C3H/RV (resistant to lethal infection) and C3H/He (susceptible to lethal infection). Resistance was abrogated by immunosuppression with cyclophosphamide or rabbit anti-mouse thymocyte serum. Immunosuppressed mice had higher yields of virus from target tissues such as brain than non-immunosuppressed mice. Paradoxically, C3H/He mice given antithymocyte serum had an increased average survival time. Following immunization with inactivated virus and adjuvant both strains of mice withstood ip challenge with virus. In contrast only resistant mice (C3H/RV) were unable to withstand ic challenge. Similarly C3H/RV mice were able to withstand ic challenge after passive immunization with anti-Banzi immune ascitic fluid, whereas C3H/He mice succumbed. Attempts to protect susceptible mice from lethal infection by transfer of non-immune C3H/RV splenic cells were generally unrewarding, although in several experiments recipients of non-immune resistant type cells had an increase in average survival time of several days. An in vitro microcytotoxicity test for Banzi virus was developed. It was shown that splenic cells from both resistant and susceptible mice were specifically cytotoxic for virus-infected L-929 target cells.

HRP-0019775/6GA PC **A11**/MF **A01**
Public Health Service, Bethesda, MD. Div. of Nursing.
Closed Drainage of the Chest: A Programed Course for Nurses.
Miriam Sierra-Franco, and Elinor D. Stanford. May 65, 237p PHS-PUB-1337

Descriptors: *Thorax, *Drainage, Nurses, Anatomy, Physiology, Therapy, Medical equipment, Surgery, Manuals, Education.

As part of its overall responsibility to improve nursing services nationwide, the Division of Nursing is assisting in the communication of new nursing knowledge and techniques and in the use of new media. Because some of the characteristics of programed instruction, such as standardization of the content, self-containment of the instruction, and active involvement of the student, have made it appear to be especially suitable for the inservice education of the professional nurse, the Division of Nursing prepared this self-instructional course. The subject chosen is one about which many nurses feel a need to improve their knowledge, particularly those who are returning to practice after several years of retirement. This course is intended as a review by the registered nurse in the hospital and as an adjunct to basic instruction. It can also have value for other nursing service personnel. The course has been found to be both practicable and effective by professional nurses with varying educational preparation and in a variety of positions.

HRP-0025461/5GA Not Available NTIS
Wisconsin Univ.-Madison. School of Nursing.
Nursing Quality Assurance -- The Wisconsin System.
Julie Hover, and Marie J. Zimmer. 1978, 7p
Pub. in Nursing Outlook, v26, n4, p242-248, Apr 78.

Descriptors: Assessments, Criteria, Evaluation, Health care delivery, Health care services, Health care, Health occupations, Measurement, Methodology, Nurses, *Nursing services, Personal health services, *Quality assurance, Reviews, Standards, *Wisconsin.

The Wisconsin system for nursing quality standard assurance, which seeks to remedy inadequacies in patient outcome criteria, is summarized. The four Wisconsin system components are criteria, assessment, standards, and improvement of care. Patient outcome criteria per set are limited to knowledge of illness, skills (technical procedures), knowledge of medication, adaptive behaviors such as changes in daily living and psychological states, and health status (e.g., skin condition). To develop a new criteria set, the population should be as broadly defined as possible, the assessment time must be stated exactly and preferably at different intervals, and the evaluation system should be kept very simple. Instruments for assessment (knowledge tests, skill audits or observation forms) and outcome guidelines (e.g., content to be learned, essential skill components) must be developed for each criterion. The results may function as the basis for modifying data collection forms, identifying the need to improve documentation and/or outcomes, deciding to reevaluate, and/or setting standards. Standards are set only after evaluation; it is recommended that they be expressed as percentages or ratios of outcomes or as items to be achieved for each criterion. Eventual assessment through interdisciplinary audit is considered the means to enhance overall care standards. Four figures illustrate a knowledge test, outcome and chart guidelines, a chart audit worksheet, and standards for a chart audit.

HRP-0025467/2GA Not Available NTIS
Flextime in Nursing -- 1: Preparing a Questionnaire.
Elizabeth M. Bissett, and Jean Graham. 1977, 4p
See also Part 2, HRP-0025053.
Pub. in Nursing Times v73 n2 p68-71 13 Jan 77.

Descriptors: Administration, Foreign countries, *Health care delivery organizations, Health care services, Health occupations, *Nurses, Nursing services, Personal health services, Personnel management.

The concept of flextime is explained and the advantages and disadvantages of flextime are discussed. A pilot inquiry was conducted to determine whether a hospital could be adequately staffed over a 24-hour period when nurses were allowed to choose their own working hours. A questionnaire was developed, which asked the staff to state their designation, their hours of day or night duty, and whether they were full-time or part-time employees. Other questions asked if flextime would or would not be possible for a hospital, and if the staff thought that the introduction of flextime would or would not be beneficial. Questions concerning personal circumstances were included. The respondents were instructed to work out their preferred, hypothetical working hours for a 2-week period, making note of days and hours when they would always or never want to work. The questionnaire was then distributed at a general hospital in an industrial area of Edinburgh. A number of minor changes were made after the results were tallied and the questionnaire was then distributed to a geriatric unit in Glasgow for use in a more extensive study. The results of the two surveys are compared.

HRP-0025610/7GA Not Available NTIS
American Hospital Association, Chicago, IL. Div. of Medical Services.
Physician's Assistant -- A Cloudy Professional Status.
Daniel R. Thomas. 1978, 5p
Pub. in Trustee, v7, n3, p31-35, Mar 78.

Descriptors: Administration, Certification, Communities, Demography, Distribution, Distributions, Health care delivery organizations, Health care delivery systems, Health care facilities, Health care services, Health care, Health manpower education, Health manpower, *Health occupations, Health resources, Licensure, Methodology, Para-

professional personnel, Personal health services, Personnel management, Policies, Quality assurance, Regulations, Rural health services.

The unclear status of the physician's assistant (PA) evident from the variety of legislation, educational approaches, and professional subspecialties for that group is discussed. Forty-one States allow physicians to delegate authority to PA's or have regulatory laws, 35 States require certification by the National Commission of Certification of PA's, and 9 States have no PA laws. State rules on physicians' supervision of PA's vary widely. Reimbursement of PA's services has remained a chronic problem, although since 1977 Federal legislation has existed at the insistence of the Appalachian Regional Commission to provide separate payment for rural health services by PA's. Typical clinical settings for PA's indicated by a 1977 survey include private partnerships (12 percent), private solo practice (31.9 percent), hospitals (47.6 percent), and others, such as health maintenance organizations and prisons. For educational preparation, 52 programs are accredited by the American Medical Association (AMA) Committee on Allied Health Education and Accreditation in collaboration with numerous other organizations. Professional support for PA's varies: in a 1975 report the AMA favors PA's but opposes their employment in supervised institutional situations. The American Hospital Association provides guidance for PA's in hospital settings but takes no stand. The American Nurses' Association and the American Pharmaceutical Association oppose their use because of functional overlapping with established professions. PA's have had their greatest success in contributing to the solution of manpower distribution problems in underserved rural areas.

HRP-0025654/5GA Not Available NTIS
Massachusetts Univ. Medical School, Worcester. Dept. of Community and Family Medicine.
Quality Assessment and Assurance -- Early Signs of Cognitive Dissonance.
David M. Kessner. 1978, 6p
Pub. in New England Jnl. of Medicine, v298, n7, p381-386, 16 Feb 78.

Descriptors: Ambulatory health services, Health care costs, Health care services, Health care, Health occupations, Measurement, Methodology, Peer review, Personal health services, Physicians, *Quality assurance, Reviews.

In recent years there has been increased consumer demand for evaluation of health services and a national framework for development of quality assurance programs. Three types of data are commonly used in such evaluation efforts: structural data referring to the characteristics of facilities and providers, data on the process which measures treatment, the patient's movement through the medical care system, and outcome data on the results of treatment. The close professional scrutiny implied by such data collection generates apprehension in many physicians. There is opposition to many types of peer review, especially to the assessment of ambulatory care, and resistance to the increased paperwork which evaluation programs require. In addition, there is little evidence that a reliable, simple, inexpensive quality evaluation system could be developed. The only feasible approach is one that includes the skills of epidemiologists and health service researchers with the judgment of clinicians in the forum of professional standards review organizations. Patients' views must also be included. At the moment evaluation efforts should concentrate more on health care costs and less on ambulatory care.

HRP-0026086/9GA Not Available NTIS
McMaster Univ., Hamilton (Ontario).
Nurse Practitioner -- What Happened.
Sandra LeFort. 1978, 10p
Pub. in the Canadian Nurse v74 n4 p14-23 Apr 78.

Descriptors: Communities, Demography, Distribution, Distributions, Foreign countries, Health manpower education, Health manpower, Health occupations, Health resources, Nurses, Registered nurses.

The director of McMaster University's School of Nursing and the director of the school's Educational Program for Nurses in Primary Care were interviewed regarding the changes that have occurred in the family nurse practitioner program since it was set up in 1970. Since its start, the program has expanded from emphasis on family practice settings to the preparation of nurse practitioners for a variety of primary care settings. The program stresses the involvement of the physician with whom the nurse will be working on completion of the program in the learning process. The role changes which must occur for both the nurse and the physician are also emphasized. The fee-for-service system in health care presents more barriers than the legal difficulties in the utilization of nurse practitioners in Canada, since reimbursements cannot be made for services provided by a nurse. The situation of the nurse practitioner in each of the Provinces is reviewed. Nurse practitioners work in a variety of settings and diverse roles in British Columbia, including four demonstration centers and two rural projects. Most nurse practitioners in Alberta work in the northern nursing stations, while the majority of nurse practitioners in Manitoba work in community clinics or Provincial health units. In Ontario, nurse practitioners work primarily in physicians' offices, community health centers, or family practice units. Although there are few trained nurse practitioners in Quebec, many nurses, particularly in rural areas, are functioning in an expanded role. There are a few nurse practitioners working in rural areas in Nova Scotia, Newfoundland, and Labrador, but none are working either on Prince Edward Island or in New Brunswick.

HRP-0026227/9GA Not Available NTIS
Monsour Medical Center, Jeannette, PA.
Medication Error Policy.
Barbara S. Wilson. 1978, 3p
Available from Supervisor Nurse, v9, n5, p53-56, 1978.

Descriptors: Administration, Health care delivery organizations, Health care malpractice, Health care, Health legislation, Health manpower, Health occupations, Individuals, Law(Jurisprudence), Legislation, Measurement, Medical personnel, Methodology, Nurses, Performance tests, Quality assurance, Registered nurses, Regulations.

Definitions of what constitutes a medication error, exact procedures to be followed by a person committing an error, and disciplinary measures prescribed must be clear, concise, and not subject to various interpretations or to personal bias. Few existing medication policies meet these requirements. Every nurse must be trained to know what action or inaction constitutes a medication error. There is also a need to define and publicize a procedure to be followed when an error occurs. The policy should be designed to encourage reporting errors. This can be done both by exhibiting sensitivity to the reasons an error occurs and by including stiffer penalties for not reporting errors. In addition, the nurse administrator should aim for prevention of future errors through a combination of education and discipline. Nurses who commit medication errors should be counseled in an attempt to develop sensitivities and awareness of the events which led to the error. Corrective actions should include procedural reviews and continuing education classes. Disciplinary action should be based on the severity of the error, the action and reaction of the nurse, and the number of medication errors committed over a specific period of time. Success of medication error policies can be evaluated by the number of medication errors reported, the number of repeat offenses, and the number of employee grievances resulting from corrective measures.

HRP-0026289/9GA Not Available NTIS
National League for Nursing, Inc., New York. Div. of Constituent League Services.
Consumerism and Health Care.
1978, 58p
Available from National League for Nursing, 10 Columbus Circle, New York, NY 10019.

Descriptors: Accessibility, Administration, Community relations, Documents, Health care delivery organizations, *Health care delivery, Health care services, Health care, Health legislation, Health occupations, Health planning agencies, Health related organizations, Information systems, Law(Jurisprudence), Legislation, Methodology, *Nurses, Nursing services, Personal health services, Regulations, Research, Sources, United states.

Papers concerning consumer issues in health care which were given at National League for Nursing (NLN) meetings are presented, appended by the NLN's perception of consumer and nurse roles in health care and guidelines for a patient's bill of rights. The impact of consumerism on U.S. health care and health care providers has been documented not only in the growing number of complaints about medical treatment, but also in individual humanistic concerns regarding health care delivery. Legislation has supported consumer involvement in the health care delivery system by providing for accountability relationships between providers, consumers, and payors. Problems in bringing consumers and providers together have been reported as a lack of commitment to overcoming delivery problems, reluctance to invest time in consumer-oriented activities, confusion and conflict over which issues or activities would benefit from input from the consumer, consumers' perception of health providers' attitudes as condescending, and contradictory interests of payors in keeping consumers healthy while making a profit on their illnesses. Patients' rights are being increasingly advocated as a means of ensuring that the patient receives responsible and appropriate care, implying that the health care system must not only recognize, but also guarantee these rights. The nurse's role in patients' rights as formulated by the NLN is to uphold those rights, including informing those concerned about them. The model patient's bill of rights provides for medical and health care access, respect and dignity, knowledge of health status, knowledge needed for decisionmaking, treatment refusal, privacy, guaranteed physicians' services, research advisement, continuity of care, and reasonable medical charges. A bibliography is also included.

HRP-0026421/8GA Not Available NTIS
University of Southern Mississippi, Hattiesburg.
Nursing Budget.
Russell C. Swansburg. 1978, 7p
Pub. in Supervisor Nurse v9 n6 p40-42, 44-47 Jun 78.

Descriptors: Economic theory, Economics, *Financial management, Health care costs, Health care delivery organizations, Health care, Health economics, Health occupations, *Nurses, Nursing care, Registered nurses.

Various aspects of the nursing budget are explored. The budget aids in objective and activity planning, manager motivation, and manager performance evaluation. The term 'budget' is defined and the relationship of the budget to objectives is discussed. Budgeting procedures and data gathering are also considered. Data gathering depends heavily on the nursing objective department to account for specific costs of each activity center, of nursing time borrowed by other departments, of expansion of nursing clinics and client-teaching, of professional travel, of supplies and equipment, of investment in equipment and facility modification over 5 years, and of special contracts like diaper services. In the controlling process, feedback to nursing administrators enables them to ascertain whether goals have been met. The program-planning/budgeting system recommended contains a budgetary package with the proposal's contribution to organizational goals, pertinent program costs, all future costs and benefits, and analyses employed for evaluating alternative approaches. A bibliography, three document specimens and two tables are furnished.

HRP-0026511/6GA Not Available NTIS
Boston Univ., MA. School of Nursing.
Accountability and Its Acceptance by Professional Nurses.
Mary E. Conway. 1977, 8p
Pub. in Communicating Nursing Research, v8, p82-89, Mar 77.

Descriptors: Health care delivery, Health care services, Health care, Health occupations, *Nurses, Nursing services, Personal health services, Projects, *Quality assurance, Research and development, Research.

A discussion of the concept of accountability and its acceptance by professional nurses is provided.

Relations found on the variables of accountability, personal autonomy, work-related autonomy, role strain, and role concept are discussed. Accountability is seen as both a legal and an ethical imperative. The three hypotheses tested are that 1) introduction of the nursing audit will be associated with an increase in accountability on the part of subjects exposed to it; 2) those subjects who score higher on a measure of personal autonomy will exhibit less role strain than subjects scoring lower; and 3) subjects who score higher than others on a measure of personal autonomy will score higher on accountability. Two groups of hospital-employed registered professional nurses served as experimental and control groups. Hypothesis 1 was not supported, nor hypothesis 2. Hypothesis 3 was supported by the control group. An explanation of the findings is presented. A table and figure highlight the data.

HRP-0026525/6GA Not Available NTIS
Veterans Administration Hospital, San Francisco, CA.
Discussion of Data-Gathering Tool on Interactional Deprivation of Mother and Premature Infant.
Frank E. McLaughlin. 1977, 6p
Presented at the proceedings of the Community Nursing Research Conference on Nursing Research in the Bicentennial year, held May 5-7, 1976, in Seattle, WA.
Pub. in Communicating Nursing Research, v9, p111-116, Apr 77.

Descriptors: Data acquisition, *Data collection, Data processing systems, Health care services, Health care, Health occupations, Methodology, Nurses, Nursing services, Personal health services, Psychology, Research, Sociology, Surveys.

The efficacy of a research tool for collecting data on interactional deprivation between mothers and premature infants is evaluated. The tool was developed specifically to measure maternal attachment behavior through measurement of the length of time between birth and visual and tactile contact by the mother with her infant. It is a 21-item self-report inventory. The first seven items pertain to the concept of maternal interactional deprivation in terms of duration, sense modality, and caretaking components. The other 14 items contain variables thought to influence interactional deprivation and background demographic characteristics. Particular attention is given to the construction of the tool, scoring procedures, and the reliability of the tool. It is felt that there is ample justification for a research tool to measure maternal attachment behavior. Justification for the form of the tool described is considered to be somewhat slight. Ways of measuring interactional deprivation that are not so dependent on retrospective maternal recall are examined. The implications of the research tool for nursing intervention are discussed.

HRP-0026552/0GA Not Available NTIS
Wyoming Univ., Laramie. Dept. of Business Administration.
Manpower Planning for Nurse Personnel.
Timothy J. Keaveny, and Roger L. Hayden. 1978, 7p
Pub. in American Jnl. of Public Health v68 n7 p656-662 Jul 78.

Descriptors: Communities, Demography, Guidelines, Health care services, Health manpower education, Health manpower, Health occupations, Health planning, Health related organizations, *Health resources, Institutions, Medical education, Methodology, *Nurses, Nursing services, Personal health services, Policies, Population migrations, Registered nurses, Schools, Universities.

A technique for ascertaining the basic components of a health manpower plan is described. The technique may be applied to manpower planning for nursing personnel at the State or regional level. Variables affecting the supply of health manpower resources are examined. Steps in the planning process are outlined. Implementation of the planning process is achieved through application of computer-based decision support systems. The application of the proposed systematic integrated health manpower planning technique is described. It was used to determine the need for nursing personnel at the State level in Wyoming. It is pointed out that projecting a future supply of nurses involves identifying the current supply and estimating future flow into and out of the State. Components considered in estimating the flow for Wyoming are listed. It is pointed out that because the system is computer-based, revisions of planning strategies involve little time and personnel effort. In order for manpower planning to be effective, the participation of key personnel from the State is imperative. Figures highlight the data. References are included.

HRP-0026631/2GA Not Available NTIS
Public-General Hospitals -- Here Today, Here Tomorrow.
Alan L. Appelbaum. 1978, 4p
Pub. in Trustee, v31, p43-46, May 78.

Descriptors: Acute care, Allocations, Financing, Funds, Guidelines, Health care facilities, Health care services, Health planning, Health resources, Inpatient care, Local government, Methodology, Patients, Personal health services, Policies, Public facilities, Public health services, State government.

This article discusses the findings and recommendations of the final report of the Commission on Public-General Hospitals. The commission, which was charged with assessing problems in the public hospital sector and suggesting possible solutions, identified 1,905 public general hospitals and divided them into 4 categories for discussion (90 urban, 357 metropolitan, 1,413 rural, and 45 university). Several issues upon which the future of the public-general hospital sector rests were identified, e.g., whether the government jurisdictions that own public-general facilities continue to perceive health care delivery roles for themselves in the future, and whether Federal and State governments assume greater responsibility for financing the care of the poor. The commission concluded that public-general hospitals should be maintained and improved as valuable components within emerging regionalized health care delivery systems. Problems in achieving maintenance and improvement were discussed, especially finances. The urban hospitals were seen as having the most severe problems. Broad-based community roles and responses are recommended in adapting public-general hospitals to current needs, regulations, and funding sources.

HRP-0026659/3GA Not Available NTIS
Texas Univ. Medical Branch at Galveston.
Developmental Approach to Learning Wellness Behavior. Part II. Adolescence to Maturity.
John G. Bruhn, and F. David Cordova. 1978, 6p
See also Part 1, HRP-0026658.
Pub. in Health Values -- Achieving High Level Wellness v2 n1 p16-21 Jan-Feb 78.

Descriptors: Age groups, Ailments, Classifications, Communities, Demography, Health care technology, Methodology, Preventive medicine.

The idea of wellness as learned behavior is presented in terms of the developmental period from adolescence to maturity. During the adolescent stage, the individual searches for values and shapes his own identity without a broader context than that of the immediate family or environment. The premise is that unless an adolescent has already learned to value and practice wellness, peer pressure for acceptance during this period of time can be overwhelming to join in behaviors that are detrimental to health, such as use of drugs. In early adulthood, as career decisions and involvement increase in frequency and importance, the influence of the work ethic predominates. The habits associated with the work ethic may deemphasize recreation of a physical type or may emphasize certain consumption patterns and ideals. Unless the individual has a long acquaintance with the meaning of healthful recreation and self-control in relation to dietary consumption, this period may prove detrimental to wellness behavior. In middle age, there is increasing concern with health and healthful lifestyles that may or may not be communicated between generations. In maturity, the individual applies wellness behavior in new ways to realize his status in the total environment and life cycle. It was concluded that learning wellness is a lifelong process that incorporates increasing experience and knowledge with the basic concept of wellness as a matter of choice.

HRP-0026747/6GA Not Available NTIS
Catholic Univ. of Louvain (Belgium).
Problem-Oriented Medical Records According to the Weed Model.
F. H. Roger, J. De Plaen, A. Chatelain, E. Coche, and M. Joos. 1978, 17p
Presented at the meeting of the French Association for the Application of Medical Informatics, Nov 15, 1976, Paris, France.
Pub. in Medical Informatics v3 n2 p113-129 1978.

Descriptors: Data processing systems, Data processing, Health care, Health manpower education, *Medical records, Methodology.

A problem-oriented medical records system based on the Weed model of an education system based on use of medical problems on record to guide a comprehensive approach to the patient is proposed. Experience with Weed's model at the University of Vermont revealed some confusion of concepts and limitations at the manual and informatic levels. For instance, organization of the data base under a problem list and the system logic biased the medical information because of subjective interpretation by individual physicians. Also, the program was more oriented toward machine capabilities of information storage and retrieval than toward a learning experience. Revision of the Weed model has been performed to provide a chronological source-oriented organization of the data base, relevant data defined by a problem list where patients' problems are distinguished from physicians' problems, a decision-oriented plan of work including diagnosis and treatment, and a logical outcome record for use in intrahospital and interhospital data processing. It was concluded that the improved model provides a medical record that is both explicit and integrated, enabling decision-making based on previous and expected results. Furthermore, use of such a system on a large population basis is proposed to resolve individual problems in the community context and perhaps to shed light on community problems which affect individuals.

HRP-0026754/2GA Not Available NTIS
Washington Univ., Seattle. School of Social Work.
Teenage Pregnancy -- The Need for Multiple Casework Services.
Steven P. Schinke. 1978, 5p
Grants PHS-HD-11095, PHS-HD-02274
Pub. in Social Casework v59 n7 p406-410 Jul 78.

Descriptors: Child health services, Communities, Demography, Fertility, Health care services, Health education, Personal health services, Public health education, Social services, Vital statistics.

Teenage pregnancy in the United States is discussed in terms of possible interventions. The number of teenage pregnancies has recently increased, in contrast to the generally declining U.S. fertility rate. In 1974, 59 percent of the more than 1 million teenage pregnancies resulted in live births, 27 percent were terminated by induced abortion, and 14 percent were reported miscarriages. Medical risks for both mother and child are greater with teenage maternity cases. Social and psychological problems also result. Past intervention has focused on providing health information and family planning services. Because this approach has failed to reduce teenage pregnancies, a multiple casework services approach is suggested as an alternative. The social casework approach emphasizes primary prevention, early intervention, and postpartum services. Primary prevention involves sex education, contraceptives, and the opportunity to learn social and interpersonal skills with less risk of pregnancy. Early intervention focuses on prenatal care for the mother, access to community resources, and counseling, including abortion counseling. Postpartum services focus on continuing education, employment, and community resources for aid. Experience in application of the multiple casework services approach has shown the success of focused, direct intervention among teenage parents and teenage future parents.

HRP-0026801/1GA Not Available NTIS
American Hospital Association, Chicago, IL.
VE Success Predicted.
Paul W. Earle. 1978, 2p
Pub. in Osteopathic Hospitals, v22, n7, p16-17, Aug 78.

Descriptors: Economics, Health care costs, Health care, Health economics.

The success of voluntary health care industry efforts to contain costs is predicted on the basis of industry attitudes and statistics. Such statistics indicate that the rate of increase for single economic indicators in the industry, except for outpatient visits, declined in 1977 from the 1976 rate. For instance, the decrease in community hospital expenditures was 3.5 percent. The downward trend in the industry statistics is also evident from preliminary 1978 figures, in spite of an increase in the overall inflationary rate in the economy and the impact of the new Social Security taxes and minimum wage rates mandated by the Federal Government. Direct communications from individual hospitals support the decreasing rates of increase. Controversy over the source of statistical data and charges and countercharges of data manipulation are discussed, pointing out the various approaches used by government to either support or refute policy as needed. The industry's data sources are declared open to audit if any need to do so is found. These data have shown that the industry's effort to contain costs was beginning to have a positive effect even before the voluntary effort was instituted as a program. It was concluded that the voluntary effort program can meet key objectives in 1978 if the government doesn't burden the industry with new laws and regulations, if the inflation in the general economy doesn't get too high, and if hospitals and medical care providers continue their demonstrated progress in containing costs.

HRP-0026805/2GA Not Available NTIS
Texas Univ. at Austin. Center for Social Work Research.
Consolidation and Integration.
David M. Austin. 1978, 9p
Pub. in Public Welfare, v36, n3, p20-28, 1978.

Descriptors: Guidelines, Health care services, Health planning, Methodology, Personal health services, Policies, Social services.

The modern trend toward consolidation, integration, and control of human services is examined. Historically, human services have most often been provided within family units, with outside specialists called in only when the problem could not be managed. The first formal organizations for human services, e.g., orphanages, arose from the need to provide continuous care for deprived individuals. A program explosion occurred in the 1960's and early 1970's that proliferated the types and numbers of social services available and necessitated the introduction of generalist managers. Because Federal funding was all important to most State and local human service systems, the generalist manager was required to solicit funding, manage service systems, and control program development and expenditures. A key element in the work of these managers has been the attempt to consolidate and integrate the human service programs as an aspect of rationalization and reducing costs. Some frameworks for clustering human service activities are suggested with due respect for traditional professional domains and the need to gain some unity of effort. The conclusion drawn is that proposals for restructuring human service programs must be accountable to potentially conflicting objectives: fiscal and quality controls and improvement of services and their availability.

HRP-0026825/0GA Not Available NTIS
Department of Health and Social Security, London (England).
Priorities in the Health and Social Services -- The Way Forward.
Sep 77, 51p
Available from Her Majesty's Stationery Office, 49 High Holborn, London VC1V6HB, England.

Descriptors: Accessibility, Acute care, Ailments, Documents, Foreign countries, Guidelines, Health care costs, Health care services, Health care technology, Health care, Health manpower education, *Health planning, Inpatient services, Methodology, Personal health services, Policies, Preventive medicine, Public health services, *Social services, Sources.

All priorities in the health and social services in Great Britain were discussed from the viewpoint of expenditures. Four priorities are listed: prevention, community health care, health services, and hospital services. With regard to these priorities, certain commitments have been made affecting economic circumstances of health clients, geographic redistribution of health resources, training and education programs for both health and personal social services, meeting revenue consequences of capital developments, filling gaps in services, and applying contractual costs from earlier capital programs to current programs. Short-term difficulties arising in accomplishing the priorities of the British health and social services programs are identified. Among these are public expectations of the services, opposition to redistribution of resources, and adequate funding. The decision has been made to continue programing and funding aimed at gradual redistribution of service resources in accordance with established principles, with continual refinement. Long-term difficulties in accomplishing these aims lie in population changes, appropriate implementation strategy, and planning with accountability to resource and money projections. Notwithstanding the practical difficulties being encountered and which are expected, a prediction is made for eventual success in presenting fairly distributed and adequate health and social services in Great Britain. The appendixes present information on planning, strategy, resource data and allocations, and a bibliography.

HRP-0026887/0GA Not Available NTIS
Health Services Administration, Rockville, MD. Office of Communications and Public Affairs.
Pediatric Nurse Practitioner -- Succeeds Mother as Indian Health Care Provider.
Robert N. Isquith. 1978, 4p
Pub. in Commitment v3 n3 p22-25 1978.

Descriptors: Classifications, Colorado, Communities, Demography, Ethnic groups, Health care delivery, Health care services, Health manpower, Health occupations, Health resources, Job analysis, Nurses, Nursing services, Personal health services, Registered nurses, Research, State regions.

The effort of a pediatric nurse practitioner (PNP) is cited as an example of how the Indian Health Service is attempting to make health care more accessible through the use of expanded role nurses and physicians' assistants. The PNP provides care to patients at a clinic in Ignacio, Colo.; most of her experience has been with the Indian Health Service. Training was received during a 4-month period at the University of Colorado Medical Center. At the clinic, she performs physical examinations, assesses medical needs, prescribes and dispenses medications, operates X-ray equipment, performs minor laboratory tests, and treats cuts and bruises. When a problem is encountered, assistance is provided by two physicians in a nearby town. About one-third of her time is spent in the community where she does prenatal and postnatal teaching, follows diabetics and others with chronic conditions, visits trauma patients, and seeks out persons who have not appeared for appointments to find out why. If requested, she visits the elderly who are hesitant to go to the center. The PNP tries to make her work as compatible as possible with the beliefs of patients. In her work, she has demonstrated the goals of the Indian Health Service and also the effectiveness of Indians serving Indians.

HRP-0026991/0GA Not Available NTIS
Trinity Univ., San Antonio, TX. Dept. of Health Care Administration.
Hospital Information Systems -- A Current Perspective.
Charles J. Austin, and Barry R. Greene. 1978, 18p
Pub. in Inquiry v15 n2 p95-112 Jun 78.

Descriptors: Acute care, Administration, Health care delivery organizations, Health care delivery, Health care services, Health care, Hospital administration, *Information systems, Inpatient services, Methodology, Personal health services, Projects, Research and development.

The state-of-the-art of information processing in hospitals for both clinical and administrative purposes was examined. The objectives of assessment were to evaluate the extent to which information systems support hospital management processes, to determine major problems and conceptual limitations in present approaches to information system development, and to suggest directions for future research. A 1976 survey of hospitals indicated that computer-assisted clinical or medical information systems are used in 40 percent of responding hospitals to index and control medical records and in 20 percent for additional information processes. Other hospitals reported using general administrative information systems. The applications of computerized information systems have included diagnosis, treatment and followup, patient monitoring, laboratory automation, medical records, and pharmacy information. Administrative sector applications relate to facility utilization and scheduling, service utilization, financial information, materials and facilities management, and personnel data. Some integrated systems compile and analyze data on utilization, distributive information, and care outcome. Problems encountered in these applications have included technological limitations, economic factors, external factors (e.g., reporting requirements), conceptual limitations in design, and managerial shortcomings. Some standards for effective medical information systems were proposed.

HRP-0027198/1GA Not Available NTIS
Maryland Univ. Hospital, Baltimore.
Nosocomial Infection -- The Hidden Cost in Health Care.
Sandra H. Polakavetz, Mary Ellen Dunne, and John S. Cook. 1978, 4p
Pub. in Hospitals, v52, n16, p101-102, 104, 106, 16 Aug 78.

Descriptors: Ailments, Control, Diseases, Disinfection, Environmental health, *Health care costs, Health care facilities, Health care technology, Infections, Injuries, Methodology, Preventive medicine, Sanitation.

Excessive length of hospital stay due to nosocomial infections is having a significant impact on health care costs. This paper suggests ways of reducing the incidence of infection, thereby reducing length of stay and patients' bills, while at the same time improving the quality of patient care. Among the suggestions for reducing the risks of infection are: controlling antibiotic usage, limiting unnecessary invasive procedures, emphasizing infection prevention and control through the use of aseptic techniques, improving personal hygiene habits, such as those related to hand washing, and structuring the reimbursement and regulatory system to facilitate these practices. Antibiotics should not be viewed as sure cures for infection. In fact, the introduction of antibiotic therapy has resulted in Gram-negative organisms, which are themselves pathogenic and even fatal. Nosocomial superinfections must be considered dangerous and life-threatening. It has been estimated that more than 100,000 deaths occur annually due to Gram-negative sepsis alone.

HRP-0027478/7GA Not Available NTIS
Michigan Dept. of Public Health, Lansing.
Social Services Approach Helps Early and Periodic Screening, Diagnosis and Treatment (EPSDT) Program Serve Total Needs of Children.
Richard Currier. 1978, 4p
Pub. in Forum Health Care Financing Administration, v2, n3, p10-13, 1978.

Descriptors: Ambulatory health services, *Child health services, Classifications, Communities, Demography, Ethnic groups, Health care services, Health manpower education, Health screening, Indigents, Michigan, Personal health services.

Michigan's Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program has proved successful in providing for the health problems of needy children. One reason for this success has been the cooperation of the Public Health and Social Services departments. Several examples of the program's effective handling of difficult child health cases are described. They reveal that many different types of health providers are involved and that extensive coordination of activities over an extended period of time is required. A course was designed for Michigan outreach workers which focused on community resources, problems such as alcoholism and drug abuse affecting families, and methods for dealing with aggressive attitudes. Michigan was also among the first to plunge into the massive preventive health program enacted by Congress in 1968. Since 1973, nearly a half million

children have received comprehensive physical examinations. A problem which remains to be solved is finding black children in need of treatment and insuring that they receive treatment for problems discovered during examination.

HRP-0027501/6GA Not Available NTIS
Johns Hopkins Medical Institutions, Baltimore, MD.
Juvenile Essential Hypertension -- A Challenge.
A. Avinoam Kowarski. 1978, 3p
Pub. in Urban Health v7 n5 p14-16 Jun 78.

Descriptors: Age groups, Classifications, Communities, Demography, Health care facilities, Health resources, Massachusetts, Medical care, Morbidity, State regions, Vital statistics.

A discussion of hypertension in children is presented. It is noted that the familial nature of hypertension supports the hypothesis that children with high blood pressure will remain hypertensive as adults. A hereditary component in essential hypertension is suggested by research findings. The roles of renin and mineralocorticoid hormones in essential hypertension are examined. It is noted that the disease appears to be too complex to be attributed to a single cause. A discussion is provided of the juvenile hypertension center at Johns Hopkins University Hospital. Essential hypertension is said to occur mainly among offspring of hypertensive parents. It is observed that the significance of early detection in an effort to improve understanding and enhance the prospect for preventive effort has become apparent. The preliminary results of studies carried out at Johns Hopkins indicate that several identifiable forms of essential hypertension exist and that individual patients can be recognized as having one or another of these forms. It is noted that this information may help in establishing better forms of treatment. Young patients, it is pointed out, may be harmed by treatment appropriate for adults.

HRP-0027561/0GA Not Available NTIS
Rural Health Clinic Services Act of 1977.
Henry K. Silver, and Patricia R. McAtee. 1978, 3p
Pub. in Nurse Practitioner v3 n5 p30-32 Oct 78.

Descriptors: Financing, Health care delivery systems, Health care delivery, Health care services, Health insurance, *Health legislation, Health manpower, Health occupations, Health resources, Law(Jurisprudence), Nurses, Personal health services, Physician assistants, Physician extenders, Prepaid health care, Public health insurance, Registered nurses, *Rural health services.

A discussion of the rules and regulations promulgated for the implementation of the Rural Health Services Clinic Act of 1977 is provided. The act, which represents a significant milestone in recognizing the expanded role that nurse practitioners and physicians' assistants may have as health providers, offers these providers an opportunity to take a prominent role in developing and operating rural health centers. Medicare and Medicaid funds have been made available for reimbursement of clinics in rural areas for services provided by qualified nurse practitioners and physicians' assistants. The clinic services supplied by a nurse practitioner or physicians' assistant should be under the medical supervision of a physician. Individual States must delineate the limits of the nurse practitioner's practice. It is pointed out that it is in the interest of nurse practitioners to make their views known to legislators. Nurse practitioners are urged to join together and work toward implementing changes in State laws governing the practice of nurse practitioners. It is said to be to everyone's advantage to have the role of the nurse practitioner defined in as broad terms as possible consistent with the provision of the best care for the patient.

HRP-0027564/4GA Not Available NTIS
Arizona Univ., Tucson. Coll. of Nursing.
Personality Testing for Better Staffing in Mental Health Facilities.
Mary Ellen Hazzard, and Elizabeth O'Farrell.
1978, 11p
Pub. in Jnl. of Psychiatric Nursing and Mental Health Services v16 n9 p41-51 Sep 78.

Descriptors: Administration, Attitudes, Health care delivery organizations, Health care services, Health care, *Health manpower, Health occupations, Maryland, Measurement, Medical personnel, *Mental health services, Methodology, Nurse aides, Nurses, Personal health services, Personnel management, State regions, Surveys.

Personality characteristics which make individuals suitable for work as psychiatric aides are investigated on the basis of a sample of 80 practicing aides in a suburban Baltimore, Md., hospital. Important qualifications for psychiatric aides are their attitudes toward mental illness and their interpersonal relationship skills. Previous attempts at establishing other pertinent personality factors are outlined. The Edwards Personal Preference Schedule results for participating aides are correlated to job performance ratings for the subjects made by three supervisors. The results suggest that good aides may be analytical of motives, concerned with others, friend and group-oriented, persistent, hard working, more conformist than poor aides, not attention seeking, not overly critical, and have less need for detailed organization or sympathy in difficult situations. Poor aides, on the other hand, are analytical, hard working, and able to handle most situations and follow instructions, but are highly critical, unconcerned about others, attention seeking, and display a lack of concern about sex, job success, or sympathy. The findings are limited by the nonrandom nature of the volunteer sample and the rather subjective hospital good-fair-poor rating system for aides. Personality testing is recommended as a guide for selecting hospital psychiatric personnel with high success potential. A bibliography, four tables, and one figure are furnished.

HRP-0027587/5GA Not Available NTIS
Florida Gulf Health Systems Agency, Inc., St. Petersburg.
Guidelines for Sub-Area Advisory Councils -- Organization and Operation.
Oct 77, 12p
Revised edition.
Available from Florida Gulf Health Systems Agency, Inc., The Bullard Executive Center, 10051 Fifth Street N., Suite 253, St. Petersburg, FL 33702.

Descriptors: Administration, Community relations, Consumer participation, Florida, Guidelines, Health planning agencies, *Health planning, Health related organizations, Local government, Methodology, Policies, State regions.

The 1977 guidelines for organization and operation of subarea advisory councils of the Florida Gulf Health Systems Agency (FGHSA) are outlined. The legal basis for the councils is the National Health Planning and Resources Development Act of 1974 and the FGHSA bylaws. The countywide councils are to be composed of 30 to 60 members, including providers, consumers, government representatives, and indirect providers. The members are county residents with an interest in county affairs and the endorsement of a constituent group, and their terms are the same as for the governing body; other membership regulations are detailed. Council formation, officers, meetings, and mission are discussed. Basic activities include development of a regional health systems plan, establishment of an annual work program, project approval recommendations, local government advising, and governing body member training. The chairperson forms standing committees, i.e., the plan development committee and the resource development committee, as well as the ad hoc consumer majority nominating committee and other task forces and ad hoc committees as necessary. Staff support involves supplying documents, assisting in orientation for new members, attending council business meetings, and providing resource assistance for committees.

HRP-0027788/9GA Not Available NTIS
Bond and Mortgage Insurance Programs.
1978, 5p
Pub. in Topics in Health Care Financing v5 n1 p37-41 1978.

Descriptors: Administration, California, *Financial management, Financing, *Health care delivery organizations, Health care facilities, Health resources, Hospital administration.

Bond and mortgage insurance programs are discussed as sources of money for health care providers wanting to expand or renovate their physical plants. After tax-exempt revenue bonds, the most widely used third party financing vehicle is the Federal Housing Administration's (FHA) Section 242 Program. The program was designed to help hospitals obtain external financing through mortgage insurance backed by the Federal Government. The Farmers Home Administration (FmHA) programs have partially alleviated the capital financing problems of rural American health care institutions. Advantages and disadvantages of FmHA programs are cited. A discussion of California's State mortgage insurance program is provided. The program's objective is to help hospitals obtain private financing for construction projects in conformance with the statewide health plan. A table reveals a comparison of bond and mortgage insurance programs. Hospitals receiving a BBB rating or better from Standard & Poor's, Inc., based on their own credit, may apply for municipal bond insurance from the American Municipal Bond Assurance Corporation (AMBAC). Depending upon the individual hospital, AMBAC is said to generally be good for bond issues from $15 to $20 million.

HRP-0027833/3GA Not Available NTIS
Houston Univ., TX. Coll. of Optometry.
Interdisciplinary Health Care. Part I.
Siu G. Wong. 1978, 5p
Grant DHEW-07-000105
See also Part II, HRP-0027834 Part III, HRP-0027835.
Pub. in Jnl. of the American Optometric Association v49 n7 p803-807 Jul 78.

Descriptors: *Health care delivery, *Health care teams, Health planning, Methodology, Models, Research, Theories.

The historical parameters and physical components of health care are presented. A number of factors have contributed to the fragmentation of health care, including: increased numbers of support personnel; increasing numbers of physicians entering specialty areas; and, new professions as a result of Federal programs. The philosophy of team care is discussed. An interdisciplinary health team is said to be a team which can coordinate the physical, social, psychological, cultural, environmental and other components of health care to the benefit of the patient. Team care is called a systematic, logical approach to delivering comprehensive health care. It relies upon maximum utilization of professional skills and collaboration for the benefit of the patient, as well as requiring the individual professional to become acquainted with certain expertise of other professionals and to use this information when required. Team care would arrest deteriorating health early in the preventive and therapeutic cycle, keeping patients productive members of the community. The nation would thus be relieved of the financial burden it suffers because of disabled individuals. Benefits to the profession are outlined. References are cited.

HRP-0027883/8GA Not Available NTIS
Ernst and Ernst, Chicago, IL.
Group Decision Process for Resource Allocation in the Health Setting.
John G. Nackel, Jay Goldman, and William L. Fairman. 1978, 9p
Pub. in Management Science v24 n12 p1259-1267 Aug 78.

Descriptors: Financial management, Financing, Health care delivery organizations, Health care delivery, Health care facilities, Health resources.

The group decision process discussed in this article allocates an available budget to health programs based on program effectiveness. A hypothetical resource allocation problem for a hospital is presented. The resource allocation process is said to be comprised of a group determination of organizational objectives and their relative weights; an assessment of program effectiveness at several levels of program funding with respect to the objectives of the organization; and an integer programing model which enables the decision-makers to maximize program effectiveness within resource, regulatory, budgetary, and program structure constraints. A nine-step methodology to apply the effectiveness evaluation-resource allocation process is presented. Steps one through three are the preparation and frontwork needed to make the evaluations in the resource allocation

process. Steps four through six are the mathematical modeling and solution process. The last three steps are those needed to get the best solution implemented and to provide later evaluations. Four processes for resource allocation are tested by decisionmaking teams.

HRP-0027898/6GA Not Available NTIS
North Carolina Univ. at Chapel Hill. School of Dentistry.
State-Supported Incentive Program and Distribution of Dental Manpower.
T. M. Roberson, and R. P. White. 1978, 4p
Pub. in Jnl. of the American Dental Association, v97, n4, p633-636, Oct 78.

Descriptors: Dentists, Financing, Health care services, Health manpower education, *Health manpower, Health occupations, *Health planning, Health resources, Local government, Methodology, North Carolina, Personal health services, Rural health services, State government.

A discussion of an educational loan program established in North Carolina to encourage dental health practitioners to practice in areas of low dentist-to-population ratios is provided. A dental student receives $4,000 a year from the educational loan program and must agree to practice in a community of fewer than 10,000 people, or in a designated local or State health facility. The program obligation may also be satisfied by primary care practice in any approved, underserved area. If the loan recipient does not fulfill his practice requirements, the loan must be repaid in full with interest within 90 days of the end of his deferred status, usually the date of graduation from dental school. Results of the program are outlined. It is noted that while all dental loan recipients did not satisfy their obligations by practicing in sparsely populated areas in North Carolina, only 8 percent are known to be practicing in States other than North Carolina. During the 30-year history of the program, 67 percent of the dental loan recipients have complied with the program requirement. The program is said to be successful in supplying dental manpower to rural areas.

HRP-0027922/4GA Not Available NTIS
Johns Hopkins Hospital, Baltimore, MD. Dept. of Emergency Medicine.
Emergency Nurse Practitioner -- The Role and Training of an Emergency Health Professional.
Valerie Stafford Hardy. 1978, 5p
Pub. in Jnl. of American College Emergency Physicians v7 n10 p372-376 Oct 78.

Descriptors: Ambulatory health services, *Emergency medical services, Health care services, Health care, Health manpower education, Health manpower, Health occupations, Health resources, Nurses, Nursing services, Personal health services, Personnel development, Physician assistants, Physician extenders, Quality assurance, Registered nurses.

The role and training of emergency department nurse practitioners (NP's) are described and their skills compared to those of physicians' assistants (PA's). NP programs require 16 to 48 weeks (median 41) for a certificate or 44 to 72 weeks (median 60) for a master's degree, compared to about 2 years for PA's; the nursing program, however, demands more previously acquired knowledge of applicants. NP training places great emphasis on chronic or well-patient care, counseling of patients and psychosocial care, and health maintenance plan development, while the PA has a comparatively stronger educational base in medical science and diagnostic as well as laboratory procedures. The legal standing of NP's is unclear: hospitals and physicians need no malpractice insurance for NP's, but third-party insurers do not reimburse NP's services. NP's have been especially useful and cost-effective in the busy emergency department for providing advanced life-support, continuity of care, health teaching to the nonacute patient, and dispensing of medications. The quality of patient care by NP's has proved consistently above average, and patients' acceptance is remarkable. Recommendations include development of evaluation mechanisms, new training programs as required, appropriate certification legislation, and nurses' responses to needs of the hospital and community.

HRP-0028046/1GA Not Available NTIS
New Jersey Dept. of Environmental Protection, Trenton.
Social Responsibilities in Cancer Detection -- What State Government Is and Should Be Doing.
Peter W. Preuss. 1978, 4p
Pub. in Jnl. of the Medical Society of New Jersey v75 n11 p759-762 Oct 78.

Descriptors: Communities, Demography, *Environmental health, Health care, Industrial medicine, Mortality, *New Jersey, Occupational safety and health, Sociology, State regions, Vital statistics, Water pollution.

Through its Program on Environmental Cancer and Toxic Substances, New Jersey is working to identify and deal with environmental causes of cancer. This paper discusses three specific projects conducted in this program: an analysis of carcinogens and toxic substances in the State's groundwater; an environmental analysis of factors possibly related to the incidence of leukemia and Hodgkin's disease in Rutherford, N.J.; and a statistical study of cancer mortality in that State. Groundwater is being examined for 50 toxic chemicals, a number of which are known or suspected carcinogens. They include organic chemicals, pesticides, and heavy metals. Data gathered thus far reveal trace levels of some of the chemicals in all wells. A majority of the wells found to be contaminated with organic chemicals are located in densely populated and heavily industrialized areas. An epidemiological survey is being conducted in Rutherford to determine whether the number and location of diseases represents an unusual cluster or a statistical quirk, and what, if any, relationship or pattern is associated with the cluster of cases that could help to explain them. The third study is attempting to identify mathematical associations between the geography of cancer mortality and the geography of factors thought to lead to elevated or reduced cancer risk. These projects complement a series of studies being carried out by other State agencies.

HRP-0028241/8GA Not Available NTIS
Georgetown Univ., Washington, DC. Dept. of Community and Family Medicine.
Assessing Technical Performance at Diverse Ambulatory Care Sites.
Marian Osterweis, and Edward Bryant. 1978, 16p
Grant PHS-HS-01040
Pub. in Jnl. of Community Health v4 n2 p104-119 1978.

Descriptors: *Ambulatory health services, Health care services, Health care, Measurement, Methodology, Personal health services, Quality assurance.

Three ambulatory care organizations were studied to test methods for assessing the quality of health care. The testing methods used written medical records as the primary data sources and focused on the process of care rather than on the outcome. The 'tracer approach' was used to examine the process of care for selected conditions. Hypertension, obesity, urinary tract infection, iron deficiency anemia, otitis media, nonstreptococcal pharyngitis, streptococcal pharyngitis, and immunizations were the indicators used. An age-sex stratified random sample was used to select patients' records. An additional methodological feature was that a fixed 1-year study period was used. Data were collected per patient visit rather than per episode of illness. For all the tracer conditions, discrepancies existed between the expected process of care and the actual process of care. There were substantial and regular variations between the test sites on virtually every indicator of performance. Patients' records show much less promise as a data source for assessing the management of chronic conditions than for acute conditions. The stratified random sampling scheme may not generate enough cases at some sites. Use of specific tracer conditions may likewise generate insufficient data for making interorganizational comparisons. Tables display the results for each of the tracer conditions at each site and an additional table summarizes the advantages and disadvantages of this study's methodology.

HRP-0028251/7GA Not Available NTIS
American Inst. of Planners, Washington, DC. Dept. of Metropolitan and Regional Planning.
Innovation and Action in Regional Planning.
Bruce D. McDowell. 1977, 242p
Selected Papers from the Annual Conference of the American Institute of Planners (58th), October 25-29, 1975, San Antonio, TX.
Available from Bureau of Urban and Regional Planning Research, University of Illinois, 909 West Nevada, Urbana, IL 61801.

Descriptors: California, Guidelines, Health care delivery systems, Health care services, Health legislation, Health occupations, *Health planning, Law(Jurisprudence), Maryland, Mental health services, Methodology, Michigan, Minnesota, New York, Personal health services, Policies, Regions(United States), Rural planning, State regions, Strategies, Texas, Theories, Virginia, West Virginia.

Accomplishments of regional health planning are reviewed in this collection of 20 essays presented at the 1975 Annual Conference of the American Institute of Planners. The essays are grouped under four headings: Growth Policy, Federal Aid Impacts, Emerging Social Concerns, and Involving Citizens and Community Leaders. Each of the major headings is preceded by a one-page summary of general issues covered. Specific topics addressed in the essays are metropolitan and regional planning, growth management, regional capital improvements programing, areawide management of water quality, reorganizing for areawide health planning, regional housing and suburban deterioration, manpower planning, regional planning for the delivery of community mental health and mental retardation services, leadership attitudes, interjurisdictional involvement in project planning, and land use planning. The experiences of Maryland, Minnesota, California, Michigan, Virginia, West Virginia, New York, and Texas in regional planning are reported.

HRP-0028272/3GA Not Available NTIS
Chicago Univ., IL. Center for Health Administration Studies.
Overview of a Design to Evaluate the Impact of Community Hospital-Sponsored Primary Care Group Practices.
Ronald Andersen. 1978, 5p
Pub. in Medical Group Management v25 n5 p42-46 Oct 78.

Descriptors: Acute care, Financing, Health care delivery, Health care facilities, Health care services, Health resources, Inpatient services, Medical services, Personal health services, Projects, Research and development.

An approach to evaluating the impact of community-hospital-sponsored primary group practices on access for communities and individuals is discussed. The Robert Wood Johnson Foundation has financed 40 community hospitals in 34 different States in order to establish hospital-supported primary care group practices. The foundation's program, objectives include developing a primary care model that will improve the access to medical care of those served by the program, and encouraging community hospitals to assume a larger institutional responsibility for the delivery of primary medical services. To provide information to other interested hospitals and communities that might benefit from the Community Hospitals Programs (CHP's), a study team at the Center for Health Services Research at the University of Washington at Seattle is documenting the organizational and financial development and survival of the groups. In addition, a research group at the University of Chicago's Center for Health Administration Studies is evaluating the impact that the group practices have on access to medical care in the communities served by the programs. The discussion deals with design problems related to implementation of the evaluation effort and the analytic plan for measuring level of access to medical care.

HRP-0028387/9GA Not Available NTIS
Florida State Univ., Tallahassee. School of Social Sciences.
Investigation Into the Major Determinants of Nursing Home Costs.
Herbert Gustav Traxler. Dec 78, 197p
Doctoral Dissertation.
Available from University Microfilms International, 300 N. Zeeb Road, Ann Arbor, MI 48106.

Descriptors: Communities, Demography, Economic conditions, Economic studies, Economics, *Flor-

ida, *Health care costs, Health care, Health economics, Inpatient care, *Long term care, Nursing care, Patients.

Nonquality determinants of nursing home costs are investigated, based on census and fiscal data from over 1,300 cost reports submitted under the Florida Medicaid program for reimbursement during the 6-year period between 1971 and 1976. The econometric analysis shows that mean costs were higher for nursing homes located in urban areas than for nursing homes located in rural areas. Most nursing homes were controlled by private profitmaking corporations. The mean size and occupancy rate of nursing homes increased between 1971 and 1976. Consideration is given to factors determining the need for long-term care, the governmental response to nursing home costs, alternatives to institutional long-term care, factors related to nursing home output (the production function), and noneconomic factors influencing the cost of nursing home care. The policy implications of the study findings are discussed. Supporting data, a bibliography, and references are included. Additional information on the study is appended.

HRP-0028520/5GA Not Available NTIS
Doctors Vs. Blue Shield -- The First Big Battle.
Steven B. Enright. 1978, 5p
Pub. in Medical Economics v55 n23 p27-29, 32 27 Nov 78.

Descriptors: Financing, Health care delivery, Health care services, Health care, *Health insurance, Health legislation, Health resources, Law(Jurisprudence), Legislation, Massachusetts, Medical services, Personal health services, *Physicians, Prepaid health care, Regulations.

A legal battle involving Massachusetts physicians and Blue Shield could have national implications. The physicians have gone to court to contest that State's 'lock-in' Blue Shield contract which virtually compels participation in Blue Shield while forcing physicians to accept whatever amounts Blue Shield designates as payment in full. The Massachusetts physicians charge Blue Shield with having failed to make good on its promise to update physicians' fee profiles periodically so that at least 90 percent of all charges would be paid in full. Both sides claimed initial victory when Superior Court rulings upheld charges that Blue Shield failed to fulfill its contractual obligations to physicians and failed to update charges on a regular basis but dismissed charges that Blue Shield kept payments to physicians at artificially low levels. On the Federal court level, the Massachusetts Medical Society has filed suits on behalf of physicians charging the carrier with violations of antitrust laws.

HRP-0028536/1GA Not Available NTIS
Medical Coll. of Wisconsin, Milwaukee.
Model for Planning Health Care in Patients With End-Stage Renal Disease.
Alfred A. Rimm, Arvin B. Weinstein, Walter Piering, Jacob Lemann, and Weldon D. Shelp. 1978, 4p
Pub. in Archives of Internal Medicine v138 n12 p1783-1786 Dec 78.

Descriptors: Health care services, *Health planning, Medical services, Methodology, Models, Personal health services, Social services, Terminal care, Theories, Wisconsin.

This paper presents a model designed to assist in planning health care for patients with end-stage renal disease. The three specific modalities of treatment addressed in the study include in-center hemodialysis, home dialysis, and renal transplantation. All aspects of modality use are accounted for by the model. Data on 979 patients on dialysis in Wisconsin between 1970 and 1975 were used for the analysis. Specifically, the three modalities were analyzed using a six 'state' model to show how the patients were managed. The states encompass the first 4 months of in-center dialysis, subsequent in-center dialysis, home dialysis, the first 4 months after kidney transplant, subsequent time after kidney transplant, and deceased patients. Movement (transit probabilities) between modalities is indicated by the model. Transitional probabilities characterizing patient movement were derived from the data. The results showed in part, that each month 8.38 patients will have a kidney transplant; 2.84 percent of all patients in the first 4 months of in-center dialysis will die, and 1.8 percent of the patients after the first 4 months will die. The model was also used to project the number of patients in the future in each modality. By 1990, there will be close to 700 patients in Wisconsin on in-center dialysis, compared with only slightly more than 200 now. Four tables and two figures present the data in more detail. One table breaks down the data by sex, race, age, and type of renal disease.

HRP-0028537/9GA Not Available NTIS
American Hospital Association, Chicago, IL. Div. of Management Effectiveness.
Cost Containment -- Everybody's Bandwagon.
David H. Schaeffer. 1978, 3p
Pub. in Hospitals, Jnl. of the American Hospital Association v52 n7 p87-89 1 Apr 78.

Descriptors: Acute care, Financing, Guidelines, Health care costs, Health care delivery, Health care facilities, Health care services, Health planning, Health resources, Inpatient services, Methodology, Personal health services, Policies.

This article contends that few medical observers see much merit in the Carter administration's plan to contain health costs, and few think that it will be accepted by the Congress. The article reviews current articles in the medical literature assessing the administration's proposal. One article points out that a large part of the increase in costs is due to the expanded role of the health profession in filling roles formerly served by the community and the family. Another article points out that the proposal lumps together all hospitals, failing to take account of the different kinds of hospitals and the different kinds of services offered. A third discussion observes that the plan imposes overall restrictions without rewarding efficient hospitals or penalizing inefficient ones. One paper criticizes the proposed plan for failing to alter the demand by taking into account the effect of third-party payment which pays for about 92 percent of all hospital bills.

HRP-0028539/5GA Not Available NTIS
Bed You Shrink May Be Your Own.
Robert M. Cunningham. 1978, 3p
Pub. in Hospitals, Jnl. of the American Hospital Association v52 n10 p105-107 16 May 78.

Descriptors: Acute care, Age groups, Classifications, Communities, Demography, Health care requirements, Inpatient care, Morbidity, Patients, United states, Vital statistics.

The relationship between increased life expectancy and the need to direct more resources to caring for the elderly is explored. Inadequate funds and employment are two major hardships encountered by the elderly. A study by the American Medical Association reports that compulsory retirement and artificial barriers to employment based on age are primary factors in the deterioration of health. Many problems affecting older people are the result of emotional complications that alter physiological processes, intensify disease processes, and interfere with healing. If these people assume valuable roles in the community, their emotional and general health status should improve. Approximately $90 billion a year is spent by DHEW in Social Security payments, along with $35 billion for Medicare and Medicaid services and $2 billion for welfare and special programs. Other Federal programs spend $26 billion on civil service, military, and railroad pensions. The percentage of older people in the population, that is, people over 65 years of age, is expected to be 11.7 in 1990 and 20.9 in the year 2030. Morbidity rates in the elderly age group are high for cardiovascular disease, influenza and pneumonia, neoplasms, diabetes, renal disease, and fractures. The need for hospital beds to care for persons with chronic illnesses will therefore be great.

HRP-0028622/9GA PC **A09**/MF **A01**
Forward Management Associates, Inc., New York.
Evaluation of Programs Affecting the Elderly Minority Poor in Selected U.S. Cities. Volume I.
Final rept.,
Delwyn A. Wilkins, and Derrick L. Fraser. 15 Feb 77, 197p
Grant CSA-20807
See also Volume 2, HRP-0028623.

Descriptors: Age groups, California, Classifications, Communities, Connecticut, Demography, Economic conditions, *Elderly persons, Evaluation, Georgia, Health care delivery, Health care services, Illinois, Indigents, Maryland, Massachusetts, New York, Pennsylvania, Personal health services, Programs, Projects, Regions(United States), Reviews, Socioeconomic status, State regions, Texas.

The results of a study undertaken to determine to what extent the needs of the elderly minority poor are met by outreach and delivery mechanisms are presented. Twenty-seven Federal and federally sponsored programs which affect the elderly minority poor are discussed and ways that these programs can be incorporated to address all their needs are suggested. Reports are presented of the programs conducted in the following urban areas: New York City; Baltimore, Md.; Boston, Mass.; Hartford, Conn.; Philadelphia, Pa.; Chicago, Ill.; Atlanta, Ga.; Houston, Tex.; and Los Angeles, Calif. A discussion of how the sites were selected is provided. Reports are presented on: the evaluation of programs in each city; the evaluation of the status of outreach and delivery services to the elderly minority poor in each city; and recommendations for other ways that the needs of the elderly minority poor can be addressed. A demographic profile of the elderly minority poor is included. Tables highlight the data presented.

HRP-0028623/7GA PC **A03**/MF **A01**
Forward Management Associates, Inc., New York.
Evaluation of Programs Affecting the Elderly Minority Poor in Selected U.S. Cities. Volume II.
Final rept.,
Delwyn A. Wilkins, and Derrick L. Fraser. 15 Feb 77, 34p
Grant CSA-20807
See also Volume 1, HRP-0028622.

Descriptors: Age groups, Classifications, Communities, Demography, *Elderly persons, Ethnic groups, Government agencies, Health care delivery systems, Health care services, Health legislation, Health related organizations, Health resources, Law(Jurisprudence), Local government, National government, Personal health services, State government, United States.

Two matrixes are presented that contain information on federally funded programs and services for the elderly minority poor, and socioeconomic services and the aging network established by the Older Americans Act of 1965 (as amended) are discussed. The matrix on programs lists 27 programs, with information given on objectives or legislative intent of each program, governing regulations, administration, and financing. The matrix on program benefits and services provides data on eligibility for the following benefits and services: housing, financial assistance, health care, nutrition, recreation, legal aid, employment, transportation, education, and outreach (information and referral). Socioeconomic benefits and services provided by major Federal and federally supported programs are summarized. The components of the aging network are identified as the Administration on Aging, State agencies on aging, area agencies on aging, subcontractors (service delivery), Title III, nutrition services under Title VII, and elderly consumers. An illustration of the aging network is included.

HRP-0028665/8GA Not Available NTIS
Regression Analysis -- How To Apply It in Managing Costs.
Marvin Tummins, Thomas Oxner, and Gary Schugart. 1978, 6p
Pub. in Hospital Financial Management v32 n12 p28-30, 32-34 Dec 78.

Descriptors: Administration, Data analysis, Data processing systems, Data processing, *Financial management, *Health care delivery organizations, Health care, Hospital administration, Methodology.

Ratio analysis, often used by financial managers in analyzing present performance, may conceal shifts in relationships that would have been revealed had regression analysis been used instead. For example, a hospital that has experienced an increase in the number of patient days may have experienced a concomitant decrease in its operating cost per patient day. But such an analysis can

be misleading because a large part of a hospital's operating costs are fixed, and the analysis does not isolate the variable costs to see how they have fared with the increase in patient days. Regression analysis, also called correlation analysis, can be applied in one of three ways: the graphic method, the high-low average method, and the least squares method. All three methods yield similar results. The article demonstrates the method used to solve the equations using each method and illustrates the application of regression analysis for three hospital-type situations.

HRP-0029041/1GA Not Available NTIS
Queen Elizabeth Coll., London (England).
Evaluation -- By the People.
Marie-Therese Feuerstein. 1978, 8p
Pub. in International Nursing Review v25 n5 p146-153 1978.

Descriptors: Assessments, Criteria, Evaluation, Foreign countries, Health care delivery, *Health care services, Health care, Measurement, Methodology, Nursing services, Personal health services, *Quality assurance, Reviews, Rural health services, Standards.

The promotion of health and the evaluation of health care through a network of regional hospitals and health centers in Honduras are considered. According to the 10-year health plan of the Ministry of Health (1970-1980), rural health care is a priority and includes vaccination and environmental health programs and primary health care workers known as health guardians. Honduras is divided into seven health regions. The program's objectives, as defined in 1973, are concerned with community service and basic curative and preventive health measures. The educative process and the service component of the program were evaluated in a comprehensive approach that involved evaluation methodologies, information on the program's history and progress, questionnaire administration, relationships with other local development entities, problems related to the distribution of drugs and to communication, and conclusions and future plans. An analysis was made of health education talks given by female promoters to housewife clubs in one region. Twenty-two promoters in 19 different communities completed a questionnaire about their activities and functions. Health-related conclusions of the evaluation pertain to the need for technical training of promoters, sharper program objectives and more concrete goals, standardization of orientation courses, improved recordkeeping, a course for husbands, and greater cooperation with regional health authorities and other development agencies. Supporting evaluation data are provided.

HRP-0029042/9GA Not Available NTIS
National Inst. of Mental Health, Rockville, MD.
Expanding the Theoretical Framework for Effective Nursing.
Rhetaugh G. Dumas. 1978, 10p
Pub. in Nursing Clinics of North America v13 n4 p707-716 Dec 78.

Descriptors: Curricula, Health care services, Health manpower education, Health manpower, Health occupations, Health resources, Job analysis, Nurses, *Nursing services, Personal health services.

Leadership in nursing and expanding the focus of nursing study and practice are the focus of this article. Nursing necessitates cooperation in groups, leadership, organization, and many other social interactions and relationships that impact on workers' efficiency, achievement, and satisfaction. The amount of authority vested in individuals determines, in large part, the extent to which they assume responsibility for themselves and others. Sexism, racism, and societally-determined attitudes affect whether and how authority is vested in individuals, groups, and institutions. Authority and leadership are exercised within the context of organizations. Leadership in nursing is affected by the capitalization of power and psychological factors. It is contended that the theoretical framework for nursing must be expanded so that innovation and effectiveness can result. Attention must be given to the need for developing nursing content and approaches to meet existing and anticipated trends in the improvement of health care generally and mental health care particularly. Two case studies are cited to illustrate problems in leadership.

HRP-0029059/3GA Not Available NTIS
Stress Management Center of Metropolitan Washington, DC.
Nurse as Holistic Health Practitioner -- Expanding the Role Again.
Lynn Wilson Brallier. 1978, 13p
Pub. in Nursing Clinics of North America v13 n4 p643-655 Dec 78.

Descriptors: Health care services, Health care, Health manpower, Health occupations, Health resources, Job analysis, Medical services, *Nurses, Nursing services, Personal health services, Sociology.

The role of nurses in the practice of holistic health care, a contemporary alternative to specialized health care delivery, is addressed. The term 'wholeness' describes perceptions of the total of whatever is in the perceptual field. The term 'holistic' refers to the fact that human beings are more than the sum of their body parts. Holistic health care involves physical, mental and emotional, and spiritual aspects of aliveness. Characteristics of the holistic health care movement involve confluence of science and religion with regard to health issues and openness among practitioners about fusing alternative methods of healing with more orthodox methods. Topics to be given serious consideration by nurses who desire to take a leadership role in practicing holistic health care are mind-body-spirit interaction, humanism, stress and its effects on health, how people's belief systems and patterns of thinking affect their health, spontaneous remissions, and people's energy levels. Consideration is given to the notion of wellness and to stress and its management (stress factors, biofeedback, muscle relaxation, meditation, visualization, and positive thinking). Productivity and self-actualization are noted as results of practicing holistic health care.

HRP-0029060/1GA Not Available NTIS
Saint Elizabeth's Hospital, Washington, DC.
Nurse-Directed Psychiatric Intensive Treatment Unit.
Vallory G. Lathrop. 1978, 11p
Pub. in Nursing Clinics of North America v13 n4 p673-683 Dec 78.

Descriptors: Acute care, Ailments, District of columbia, Health care delivery, Health care services, Health care teams, Health care technology, Health care, Health occupations, Inpatient services, Mental disorders, *Mental health services, Methodology, Milieu therapy, Nurses, Nursing services, Personal health services, Preventive medicine, Psychology, Social services.

The opportunity given to the psychiatric nurse at the clinical specialist level to exercise leadership in a psychiatric intensive treatment unit at St. Elizabeth's Hospital in Washington, D.C., is examined. Five people staff the unit, and most treatment occurs between 9 a.m. and 5 p.m. A self-concept test administered to all candidates for the unit revealed that these persons had extremely low self-concepts. The overall goal and philosophy of the unit is to improve clients' total self-concept (basic identity, self-satisfaction, perception of behavior, perception of physical self, moral-ethical self, self-worth, the self in relation to primary social groups, and the self in relation to secondary social groups). The basic patient-centered modality is milieu therapy. The psychiatric nurse is concerned with how patients perceive themselves and their environment rather than with how they look to others. The general program design of the unit involves group psychotherapy, social and recreational activities, videotape feedback, and individual psychotherapy. Program adequacy is evaluated on an ongoing basis, and treatment team efforts are sustained through conferences and staff meetings. Procedures and criteria for team membership have been formulated. The team consists of a staff nurse, a forensic psychiatric technician, mental health counselors, and the psychiatric nurse clinical specialist. Approximately 25 patients participate in the unit's program, and more than 50 patients have been discharged to a less restrictive environment or to the community.

HRP-0029068/4GA Not Available NTIS
Veterans Administration Hospital, Buffalo, NY.
Preparing the Nurse Observer to Use the Quality Patient Care Scale -- A Modular Approach.
Marlene R. Ventura, and Frances Crosby. 1978, 4p
Pub. in the Jnl. of Continuing Education in Nursing v9 n6 p37-40 1978.

Descriptors: Assessments, Criteria, Curricula, Evaluation, Health care delivery, Health care services, Health care, Health manpower education, Health occupations, Measurement, Methodology, New york, Nurses, Nursing services, Personal health services, Quality assurance, Reviews, Standards, State regions.

The development of QualPacs, a 7-page 68-item quality patient care scale developed by Wandelt and Ager in 1974, is described. The QualPacs is designed to measure the quality of care rendered to patients from direct nurse-patient interactions or nurses' interactions on behalf of patients. The 68 items on the scale are grouped according to six categories: psychosocial individual, psychosocial group, physical, general, communication, and professional implications. Criteria for rating the quality of care are based on a standard of measurement, an individual frame of reference, and four care elements (care components or activities performed, long-range and short-range goals for patients, appropriateness of care in terms of patients' needs, and content and tone of care delivered). Nursing care is rated in terms of best, between, average, between, and poorest. The QualPacs concept was applied in a series of lecture and discussion sessions with four selected nurse observers at the Veterans' Administration Hospital in Buffalo, N.Y. The format of the instructional program is detailed, and competencies to be demonstrated by nurses when using the QualPacs are identified.

HRP-0029171/6GA Not Available NTIS
Coronary Care in the Community.
Aubrey Colling. 1977, 226p
Available from Croom Helm Ltd., 2/10 St. John's Rd., London SW11, England.

Descriptors: Accessibility, Ailments, Diseases, Documents, Foreign countries, Health care services, Health care technology, Health care, Injuries, Medical services, Methodology, Personal health services, Physicians, Preventive medicine, Sources.

Based upon a workshop held in March 1976, this book presents papers exploring four topics related to community treatment of coronary thrombosis in Great Britain: community care, administration of coronary care, guidelines for general practitioners, and rehabilitation and prevention in general practice settings. Basic issues surrounding community care include controversy over its effectiveness; emphasis on the importance of rapid initiation of patient management, whether in the community, ambulance, or hospital; and the utilization of mobile cardiac units which employ drug and defibrillator treatment. Discussions of the administration of coronary care range from a Nottingham study comparing home and hospital treatment of myocardial infarction patients, to the roles of ambulance personnel and general practitioners. An extended issue involves the provision of primary coronary care in the industrial environment. Guidelines for general practitioners are geared for various practice settings, ranging from the sophistication of a large town possessing a district general hospital and both mobile and hospital coronary care units, to the relative primitiveness of a country practice without a cottage hospital. Other papers focus on the general practitioner's roles in coordinating patient rehabilitation, and preventing coronary disease through patient counseling on smoking, hypertension, obesity, and lack of exercise. Bibliographies are provided following the individual contributions.

HRP-0029277/1GA Not Available NTIS
Urban Inst., Washington, DC.
Growth of Nursing Home Care.
Burton David Dunlop. 1979, 171p
Available from Lexington Books Div., D. C. Heath & Co., 125 Spring St., Lexington MA 02173.

Descriptors: Financing, Guidelines, Health care delivery, Health care facilities, Health care requirements, Health care services, Health planning, Health resources, Inpatient care, Inpatient serv-

ices, *Long term care, Methodology, Patients, Personal health services, Policies, Research.

Several misconceptions are shattered and a number of policy issues are illuminated in this study of the growth in the supply of nursing homes between the mid-1960's and the mid-1970's. Despite the widespread belief that greater availability of funding under Medicare and Medicaid spurred long-term care demand, this study of ten States shows that growth in the number of nursing home beds was more rapid before implementation of the Federal programs. In contrast to some widely publicized nursing home scandals, the image and status of nursing home care have actually risen as a result of stricter enforcement of standards. Perhaps the most important single factor contributing to the increasing demand for nursing home care is the dramatic increase in the number of very old elderly. Bed supply has not kept pace with the increasing demand, and this fact has presented policymakers with difficult problems, including inappropriate placement, ineffectual needs assessment, and weakened standards enforcement. Future government efforts should focus on expanding alternatives to nursing home care, especially residential facilities. Certificate-of-need or other comprehensive planning mechanisms should cover all long-term care settings. Reimbursement of Federal cost-sharing approaches should also be implemented. A number of statistical tables and appended materials are included.

HRP-0029344/9GA Not Available NTIS
Morris Associates, Inc., Washington, DC.
Health Systems Report -- 1978 Almanac on Federal Health Issues, Proposals, Administrative Actions, Legislation, Public Laws.
1978, 91p
Available from Morris Reports, 1346 Connecticut Ave., N.W., Washington, DC 20036.

Descriptors: Financing, Government agencies, Guidelines, *Health care costs, Health care delivery systems, Health care delivery, Health care services, Health insurance, *Health legislation, Health occupations, Health planning, Health related organizations, Health resources, Law(Jurisprudence), Mental health services, Methodology, National government, National health insurance, Personal health services, Policies, Prepaid health care, Public health insurance, United states.

This report discusses the way in which the Federal decisionmaking apparatus dealt with health issues in 1978. The document opens with an overview which indicates that the cost of care was central to all health-related activity at the Federal level during the year. Subsequent material touches on a wide range of topics, e.g., efforts to revise health planning legislation, the health planning guidelines, new tasks for health planning, the administration's health policy, appropriations, national health insurance, hospital cost containment, mental health centers, the recommendations of the Mental Health Commission report, developmental disabilities, health maintenance organizations, renal dialysis, and professional standards review organizations. Also included is a table of health legislation in the 95th Congress which lists bill titles and numbers, report numbers, the public law numbers, the date each bill was signed, and, where applicable, the date the bill was vetoed or its status at adjournment. A list of major health committees in Congress is also included.

HRP-0029346/4GA Not Available NTIS
Brookings Institution, Washington, DC.
Health and the War on Poverty -- A Ten-Year Appraisal.
Karen Davis, and Cathy Schoen. 1978, 230p
Available from the Brookings Institution, 1775 Massachusetts Ave., N.W., Washington, DC 20036.

Descriptors: Child health services, Classifications, Communities, Demography, Financing, Guidelines, *Health care delivery, Health care services, Health care, Health insurance, Health planning, Health resources, *Indigents, Methodology, Personal health services, Policies, Prepaid health care, Public health insurance, Public health services, Research, Socioeconomic status, Sociology, United states.

The areas covered by this text include basic health and poverty concerns, the public programs designed to break the connection between low income and poor health, and the strengths and limitations of Medicaid, Medicare, the maternal and child health program, and the comprehensive health centers. The time period addressed is 1965-75. The book includes recommendations for improving individual programs and public policies. Among the recommendations offered are that Medicaid be expanded to cover all poor people with a full range of benefits; that Medicare benefits be increased through the elimination of the deductible and the 3-day hospital requirement for extended care benefits and the provision of a broader range of service benefits in ambulatory care settings; and that Medicare, Medicaid, and health center programs should force the compliance of providers with the requirements of the Civil Rights Act. The appendix reviews studies which have claimed that improved access to medical care cannot be expected to improve health, in order to identify methodological problems and encourage further research and data collection.

HRP-0029353/0GA Not Available NTIS
Controlling Health Care Costs -- A National Leadership Conference.
1978, 81p
An edited transcript of the conference proceedings, June 27-28, 1977, Mayflower Hotel, Washington, DC.
Available from Government Research Corp., 1730 M St., N.W., Washington, DC 20036.

Descriptors: Economics, Guidelines, Health care costs, Health care delivery systems, Health care, *Health economics, Health legislation, Health planning, Law(Jurisprudence), Methodology, Policies, Strategies, United states.

An edited transcript of a 1977 conference concerned with controlling health care costs is presented. Following a keynote address by Senator Edward Kennedy, the question of what lies ahead is addressed from the perspective of State and Federal Government, health care economics, and medical technology. The president of the American Federation of State, County and Municipal Employees then considers the cost containment problem. Discussions which took place in working groups dealing with such topics as the implications of a surplus of physicians, alternative delivery systems, and the question of whether planning is an effective cost-containment tool are also reported. Transcripts of sessions concerned with Connecticut's experience with State regulation of hospital costs, the proposed Hospital Cost Containment Act of 1977, labor-management perspectives on the cost-containment issues, and ongoing health cost control programs. The closing remarks are by Senator Jacob Javits, who outlines an agenda for what should be accomplished.

HRP-0029356/3GA Not Available NTIS
Cornell Univ., Ithaca, NY.
Public Health -- Case Studies on the Origins of Government Responsibility for Health Services in the United States.
Joshua Ira Schwartz. May 77, 20
Discussions in Environmental Health Planning Series.
Available from Program in Urban and Regional Studies, Cornell Univ., 726 Univ. Ave., Ithaca, NY 14853.

Descriptors: Accessibility, Documents, Health care delivery, *Health care services, Health care, Information systems, Massachusetts, Methodology, New york, Personal health services, *Public health services, Regions(United states), Research, Sociology, Sources, State regions.

The objective of this essay is to develop a model of the assumption of health responsibility by government in order to provide insight into the way medical services are allocated between the public and private sectors. The essay opens with three case studies -- one on the adoption of the vital statistics recording function, one on the establishment of permanent municipal boards of health in order to control epidemic disease, and the last on development of governmental responsibility for tuberculosis control -- which are intended to illustrate the addition of a health function to the public agenda. The primary focus is on the New York City experience, although some material on the Massachusetts experience is included in the study of vital statistics reporting. The discussion then turns to the factors which contributed to development of governmental responsibility for public health, e.g., the industrial and urban revolutions, immigration and resulting prejudices, and the activities of voluntary and charitable associations. The appendixes contain material on methodological and cross-cultural considerations and an integrated chronology. A bibliography accompanies the text.

HRP-0029358/9GA Not Available NTIS
National Association of Attorneys General, Raleigh, NC. Committee on the Office of Attorney General.
Enforcing Quality of Care in Nursing Homes.
Feb 78, 89p
Available from Committee on the Office of Attorney General, National Association of Attorneys General, 3901 Barrett Drive, Raleigh, NC 27609.

Descriptors: Accessibility, Documents, Health care services, Health care, Health legislation, Information systems, Inpatient services, Law(Jurisprudence), Legislation, *Long term care, Methodology, Personal health services, *Quality assurance, Regulations, Sources.

This publication, which expresses the concern of the National Association of Attorneys General with older Americans, addresses the issue of enforcement of quality of care in nursing homes. The report opens with an overview of the nature of the problem which emphasizes that the State attorney general's involvement is essential if quality of care is to be improved. The topics addressed include the crisis in quality of care, the characteristics of nursing homes and their patients and of homes for the aged, problems in quality of care, and Medicare and Medicaid. Subsequent material focuses on State regulation of nursing homes, delicensing and decertification, injunctions, receiverships, criminal and quasi-criminal prosecutions, transfers (including 'transfer trauma') and discharges, and patients' rights (including the patient bill of rights, right to access by friends of patients, freedom from restraints, rights to personal property, guardianship, and enforcement of rights). A bibliography is included.

HRP-0029380/3GA Not Available NTIS
Child Health -- America's Future.
George A. Silver. 1978, 267p
Available from Aspen Systems Corp., 20010 Century Blvd., Germantown, MD 20767.

Descriptors: *Child health services, Foreign countries, Guidelines, Health care delivery, Health care services, Health planning, Methodology, Personal health services, Policies, Research, United States.

The focus of this study is on child health services and policy in the United States. Emphasis is placed on the need for a properly structured, family-involved child health service. This service would be national in scope, primarily preventive in concept, and simultaneously private, public, and official in character. The description, analysis, and conclusions deal with evidence that U.S. child health services should be, but are not, operating at peak performance; the reasons for the problem; the approaches used in other countries (e.g., Scotland and Holland); and the lessons that can be learned from these experiences. The details of various European systems are compared with a view towards finding explanations for their successes or failures in meeting child health goals in comparison with U.S. results. This analysis suggests that the focus in Europe is on the child and his or her needs. Finally, the study addresses the long-term benefits of a meaningful child health program. Supporting data are included.

HRP-0029420/7GA Not Available NTIS
Cornell Univ., Ithaca, NY.
Health Care Policy in a Changing Environment.
Roger M. Battistella, and Thomas G. Rundall.
1978, 390p
Available from McCutchan Pub. Corp., 2526 Grove St., Berkeley, CA 94704.

Descriptors: Ailments, Communities, Demography, Financing, Foreign countries, Guidelines, Health care costs, Health care delivery, Health care technology, Health education, Health insurance, *Health planning, Health resources, Innovations,

Methodology, National health insurance, Policies, Prepaid health care, Preventive medicine, Public health education, Public health insurance, United states, Vital statistics.

The purpose of this compilation of articles is to help consumers, nonhealth professionals, and students understand the factors underlying the signs of crisis in the U.S. health care scene and the options available for making health services more responsive to existing and future needs. The introductory material touches on such topics as growth and patterns of U.S. medical care, Federal involvement in health care, rising costs of public health, and formulation of national health policy. The first group of readings examines inconsistencies and contradictions in U.S. health care policy. Subsequent articles deal with underlying forces for change. Finally, selected unresolved issues are addressed. Among the specific concerns considered are the tradeoffs involved in most of the major features of national health insurance plans, important factors associated with the increasing importance of primary care, the role and organization of primary care, and disease prevention and health education.

HRP-0029446/2GA PC **A08**/MF **A01**
Aspen Systems Corp., Germantown, MD.
Development of a Center for Health Resources Planning Information.
Final rept.
19 Sep 77, 163p
Contract PHS-HRA-230-75-0073

Descriptors: Data processing systems, Government agencies, Health care, *Health related organizations, Health resources, Information systems, Methodology, National government.

Mandated under the National Health Planning and Resources Development Act of 1974, the National Health Planning Information Center (NHPIC) was created to facilitate Federal, State, and local health planning through the identification, collection, and distribution of information. This publication describes the history, purpose, and results of the contract awarded in 1974 to design, develop, implement, coordinate, and manage the center. The report encompasses the history and background leading to the issuing of a contract, a summary of the contractor's experience, the original designs and specifications for NHPIC products and services, a summary of progress by component (e.g., Division of Nursing component, NHPIC user panel), and recommended improvements in NHPIC procedures. As of September 1977, a full-service reference system had processed more than 4,000 inquiries. Through an extensive acquisition net, more than 40,000 documents had been acquired and users were being solicited for acquisition on a regular basis. Sixteen figures and 10 attachments are included.

HRP-0029508/9GA PC **A05**/MF **A01**
Northeastern Wisconsin Health Systems Agency, Inc., Green Bay.
Data Book for Health Planning in Northeastern Wisconsin. Second Edition.
Richard Janosik. Jul 78, 89p

Descriptors: Classifications, Communities, Data, Demography, Health care costs, Health care facilities, Health care indexes, Health manpower, Health resources, Health statistics, Health status indexes, Nurses, Physicians, State regions, Wisconsin.

This health planning data book covering 1970 to 1977 was prepared by the Northeastern Wisconsin Health Systems Agency, Inc., to provide information on the health status of area residents, the status of the health care delivery system, the effect of the health care delivery system on the health of the residents, health resources, patterns of utilization, and exposure factors affecting immediate and long-term health conditions. The data book's revision is an ongoing function of the health systems agency, and its format is basically comparative. Some illustrative and analytical materials are incorporated, but the primary thrust is on information from various settings to allow health status and health system comparisons. Data are generally presented by county, for the entire health service area, for the State of Wisconsin, and for the United States, in sections dealing with demography, socioeconomic status, and health status. Comparisons of health manpower and facilities are made by county and health service area. Hospital data are presented by the individual institutions. Data for long-term care facilities are aggregated by county only. Data pertinent to vital statistics and health economics and finance are provided. Tables present data through the use of percentages, rates, and ratios for facilities being compared. Maps depicting the health service area and a glossary of selected terms are included.

HRP-0029598/0GA Not Available NTIS
Michigan Univ., Ann Arbor. School of Nursing.
Advance of American Nursing.
1978, 757p
Available from Little, Brown and Co., 34 Beacon St., Boston, MA 02106.

Descriptors: Accessibility, Documents, Health care services, Health care, Health occupations, Information systems, Methodology, Nurses, *Nursing services, Personal health services, Sources, *United States.

This text, which is intended to provide a modern historic approach to understanding nursing in the United States, may be used by both practicing nurses and students enrolled in professional nursing courses. The discussion opens with an exploration of the roots of modern nursing which traces the development of the profession through the era of Florence Nightingale. Subsequent material moves from nurses in the Civil War through the founding of early schools of nursing, scientific medicine and its effect on nursing, nurse training schools in the 1880's and 1890's, nursing at the turn of the century and in the war with Spain, public health nursing, reform during the period from 1909-17, nursing in the two world wars, the period from 1920-33, to the Depression years. Nursing in the years after World War II, minorities in the profession, and nursing in the 1960's and 1970's are the subjects of the remainder of the book. An extensive bibliography, tables and photographs accompany the text.

HRP-0500801/6GA PC **A07**/MF **A01**
Information Management Services, Inc., Bethesda, MD.
Nursing-Related Data Sources, 1979.
Nurse planning information series.
Jan 79, 141p DHEW/PUB/HRA-79/36, PHS/DN/NPIS-7

Descriptors: Accessibility, Communities, Data processing systems, Data, Demography, Health care delivery, Health care indexes, Health care, Health manpower education, *Health manpower, Health occupations, Health resources, Health statistics, Methodology, *Nurses, Research, Sources.

Abstracts of nursing manpower studies which are either underway or have been recently completed are presented in a publication prepared under the sponsorship of the Interagency Conference on Nursing Statistics (ICONS). Included in the first part of the document are major data sources submitted by ICONS members. These persons reviewed and updated the information provided in a 1977 publication of this type. The major elements of the fact sheets include: the subject classification (nursing personnel, nursing education, health care delivery system, and/or client population); general description; the history, frequency, and latest edition; the methodology and sources used in data collection; information about the availability/accessibility of information; and a summary of the subject areas in which the data were collected and/or the data items that can be released on tape. The second part, which consists of abstracts of surveys and studies conducted by agencies other than the members of ICONS, contain essentially the same kind of information as the first part. Material not directly related to the data sources abstracted in the revised directory, and catalogs potentially of use in identifying other references to published nursing manpower statistics are included in the final section.

HRP-0500901/4GA PC **A04**/MF **A01**
Medicus Systems Corp., Washington, DC.
Relationship Between Nursing Education and Performance -- A Critical Review.
Nurse planning information series.
Feb 79, 58p DHEW/PUB/HRA-79/38, PHS//DN/NPIS-8

Descriptors: Accessibility, Documents, Health care services, Health care, *Health manpower education, Health occupations, Information systems, Methodology, *Nurses, Nursing services, Nursing, Personal health services, Registered nurses, Sources, United States.

The subject of this monograph is the effect that the type of nursing education has on nursing performance. The discussion opens with a review of the development of nursing in the United States, then turns to research studies comparing the performance of nurses who have been educated in diploma, baccalaureate, and associate degree programs. The discussion focuses first on research that has used supervisors' ratings as the indicator of nursing practice level. Studies relevant to the way that graduates from different types of programs identify problems and intervene in nursing care situations, perform on State board exams, and are employed in nursing are then addressed. The final studies considered are those pertaining to the graduates' attitudes toward professionalism. The study findings, while inconclusive, indicate that baccalaureate nurses are more likely to be involved in activities requiring leadership, patient psychosocial supports, and problemsolving, and to work in administration, education, and public health nursing. The emphasis for diploma and associate degree nurses is more likely to be on basic skills and technical care delivery. It is concluded that the division of labor between professional and technical nurses will become more necessary and apparent. A bibliography is included.

HRP-0501001/2GA PC **A10**/MF **A01**
Franklin Research Center, Philadelphia, PA.
Nurse Staffing Requirements and Related Topics -- A Selected Bibliography.
Nurse planning information series.
Jul 79, 225p* DHEW/PUB/HRA-79/39, PHS/DN/NPIS-9
Contract PHS-HRA-232-78-0090
Nurse Planning Information Series, No.9.

Descriptors: Accessibility, Administration, Documents, Health care delivery organizations, Health care requirements, Health care services, Health care, Health manpower, Health occupations, Health planning, Information systems, *Manpower requirements, Medical personnel, Methodology, *Nurses, Nursing services, Personal health services, Personnel management, Sources.

References to recent literature dealing with nurse staffing requirements and related concerns are presented in a bibliography intended to assist the nursing community and health planners in identifying the best use of nursing skills and to help nurse educators plan future educational programs. The bibliography, which supplements and updates state-of-the-art and critical reviews of the staffing literature that have appeared since 1970, includes abstracts grouped in such a way as to facilitate location of the material according to the reader's interest. The categories include settings (hospital inpatient, hospital outpatient, long-term care), staffing methodologies (economic studies, models, and strategies), needs and requirements (regional, State, and national studies), and bibliographies and summaries. Included in the citations for both published and unpublished documents is source availability information. An author index accompanies the text.

HRP-0900588/5GA PC **A15**/MF **A01**
Western Interstate Commission for Higher Education, Boulder, CO.
Nursing Resources and Requirements -- A Guide for State-Level Planning. Analysis and Planning for Improved Distribution of Nursing Personnel and Services.
Robert Gray, and Ken Sauer. 1978, 327p
Contract PHS-HRA-231-75-0803

Descriptors: Accessibility, Data processing systems, Data, Documents, Forecasting, Health care services, Health care, Health manpower, Health occupations, *Health planning, *Health resources, Information systems, Medical personnel, Methodology, *Nurses, Personal health services, Public health services, Sources.

This guide, which is intended for the use of State-level decisionmakers in the nursing, health plan-

ning, and higher-education communities, explores important aspects of planning for nursing resources and requirements at the State and sub-State levels and outlines mathematical procedures for use in projecting these resources and requirements 1 to 5 years in the future. The opening discussion focuses on the requirements planning process. Sections describing quantitative procedures for estimating future nursing personnel requirements are then presented. Subsequent material examines factors that influence the composition and availability of nursing resources and seeks to develop an analytical procedure capable of integrating these factors, with a view toward allowing quantitative projections to be made of the number of nursing resources that will be available in the future. The theoretical discussions are accompanied by profile reports showing the kind of data available at the State level. Bibliographic references are included.

HRP-0901299/8GA PC **A06**/MF **A01**
American Univ. in Cairo (Egypt). Computer Center.
Toward a Health Index. Technical Papers R/80.
Salah Aidarous. Mar 78, 24p

Descriptors: Communities, Data, Demography, Health care indexes, Health statistics, Morbidity, Mortality, Vital statistics.

In the future, a measure of health more sensitive and informative than traditional indices based soley on mortality would encompass the health characteristics of the living. This paper analyzes trends in this direction, discussing general measures of health and several proposed health indices. Health assessment must go beyond death and life expectancy rates to the distribution, by cause, of mortality and morbidity. New approaches to the development of health indices combine mortality data with some specific indicator of the health of the living which is derived from survey instruments. For example, one proposed method measures individuals' 'functional adequacy', e.g., the number of days each year an individual could fulfill his role would be taken as the measure of his health. However, the criterion for an individual's capacity to fulfill a social role at each age would have to be clearly stipulated. Another general index employs a weighted average of age-specific components derived from the death rate and a measure of the average duration of illness within an age group during one year. A useful health index should (1) show changes over time in significant health aspects and (2) be analyzed into components which describe health problems underlying the index values.

HRP-0901342/6GA PC **A07**/MF **A01**
Chi Systems, Inc., Ann Arbor, MI.
Health System Agency (HSA) Planning Procedures Manual -- Health Facility Planning and Development -- Generic Planning Process.
Jun 78, 133p
Contract PHS-HRA-230-75-0175
See also Institutional Manual, HRP-0901343, State Manual, HRP-0901341, Summary, HRP-0901340.

Descriptors: Accessibility, Data processing systems, Data processing, Data, Guidelines, Health care requirements, Health care, *Health planning, Measurement, Methodology, Policies, Sources, Strategies.

The process and méthodology of health services planning required before decisions about health resources can be made are examined. The material is intended to be used by DHEW staff, health facility architects and engineers, health planning professionals, consumers, and State health planning and development agencies and health systems agencies (HSA's). A discussion of the HSA's planning framework is provided and the different steps in the generic planning process are delineated. The material to be included in a planning policy statement is considered. A description of the service area characteristics which should be investigated, including: geography, boundaries, population, socioeconomic characteristics, environmental and lifestyle characteristics and patterns of use of health services, is provided. Variables which must be considered when estimating the needs for health services are noted. Data sources are reviewed and the ways that data should be processed, displayed and analyzed are examined. Methods of developing inventories of needed services and of the capacity of existing services are discussed. Some questions which must be addressed in matching the inventory and the capacity are noted. The plan development process is reviewed. Figures highlight the data. The appendixes contain a chart, survey questionnaires, reference sources, and a discussion of techniques for obtaining consumers' opinions.

HRP-0901404/4GA Not Available NTIS
Analyse und Bewertung der Krankenhausbedarfspläne der deutschen Bundeslander. (Analysis and Evaluation of the Hospital Requirements Plans of the German Federal States).
Von A. Schon, Dr. Kopetzky, H. Janzer, and G. Schwab. 1978, 12p
Text in German.
Pub. in Das Krankenhaus, v70, n6, p224-235, 1978.

Descriptors: Acute care, Foreign countries, Health care delivery, *Health care requirements, Health planning, *Health plans, Inpatient care, Local government, Methodology, Patients, State government, Strategies.

The Hospital Requirements Plans of the German Federal States are investigated, in particular the methods of ascertaining the requirements, the regulations covering the execution of the plans and the planning responsibilities, and the regional structure of hospital services which the Hospital Requirements Plan strives after. The evaluation discloses differences and agreements in the methods of requirements planning. In general, the following defects in planning can be established: The statistical covering of the variables designated as requirement determinants is very far from complete; The results of the services cost accounting, which are not yet available, are needed in order to be able to undertake the evaluation of the influence of the determinants on hospital requirements planning; Registering of data and terminology are insufficient; The base 'number of beds' is problematical, for it means that the present structures become fixed and that no adequate scope remains for taking into consideration other structures of hospital services; and the hospital requirements planning is carried out as capital investment planning. The planning of the capital investment required, however, presupposes knowledge of the service requirements. This latter has not yet been adequately established. Finally, some Federal States have undertaken neither apportionment according to service areas nor a breakdown of bed requirements according to specialized branches. The language of this article is German.

HRP-0901405/1GA Not Available NTIS
Krankenhausplan des Landes Hessen -- Bettenbedarf 1975 bis 1985. (Hospital Requirements Plan for the State of Hessen -- Bed Requirements 1975-1985).
1978, 36p
Text in German.
Pub. in Staatsanzeiger fur das Land Hessen, n10, p485-520, 6 Mar 78.

Descriptors: Acute care, Foreign countries, Guidelines, Health care delivery, *Health care requirements, Health planning, *Health plans, Inpatient care, Local government, Methodology, Patients, Policies, State government.

The State of Hessen in agreement with the other Federal States uses the formula 'Population x Hospital Frequency x Length of Stay: (Bed Utilization x 1000)' as the basis for the analytical calculation of its bed requirements. In view of the latest population projection for 1985 the bed requirements are reduced by 1,432 beds. This shows that the basic values of any requirements plan can provide no more than guidelines. The objective declared as health policy is the provision of 7 beds per 1,000 inhabitants for the inpatient treatment of acute cases. This goal cannot be achieved with one single hospital requirements plan. Rather, to achieve this goal, what is required is a series of requirements plans adapted to the most recent developments and findings. Characteristic of the developments to date and not unlikely future developments is the revision of the number of planned beds for 1985. The first requirements plan of 1972 had laid down only the bed capacity of buildings used on a permanent basis for health services. The extrapolation now completed lays down in addition the graded treatment scope of the hospitals. The size of the individual specialized departments was not laid down in the interests of the flexibility required. Instead increased efforts were made to achieve better coordination between the specialized departments within one hospital region. The language of this document is German.

HRP-0901407/7GA Not Available NTIS
Krankenhausplanung -- Zentralisieren oder dezentralisieren. (Hospital Planning -- Centralization or Decentralization).
K. Brandecker. 1978, 8p
Text in German.
Pub. in Offentliches Gesundheitswesen, v40, p214-221, 1978.

Descriptors: Acute care, Foreign countries, Health care delivery, Health care requirements, *Health planning, Health plans, Inpatient care, Methodology, Patients, Strategies.

With the enforcement of the Hospital Financing Law in 1972, the Federal Land Governments were called upon to draw up hospital requirements plans. As a result, the Land Governments had to plan the systematic development of a graded system of efficient hospitals covering an appropriate area, in place of the so far arbitrary and uncoordinated development of hospital services available to the population. In the absence of uniform and generally recognized determinants for the requirement of hospital beds and for the structure of the hospital service available for the population -- i.e., whether centralized or decentralized -- present-day planning by the Land Governments is liable to be mainly determined by individual ideas and concepts rather than by scientific knowledge. The gigantomania which tends to obliterate the humanitarian mandate of the hospital, is just as rampant as the economically untenable demand for the 'hospital around the corner'. It must be the task of hospital planning of the future to balance out as far as possible the available financial resources and the humanitarian mission of the hospital. The language of this article is German.

HRP-0901408/5GA Not Available NTIS
National Health Service, Copenhagen (Denmark).
Personale- og oekonomistatistik for sygehusvaesenet 1978. (Statistics of Hospital Staff and Finance 1978).
1978, 177p
Text in Danish.
Available from National Health Service, St. Kongensgade 1, DK-1264 Copenhagen K, Denmark.

Descriptors: Communities, Data, Demography, Financing, Foreign countries, Health care costs, Health care delivery, Health care facilities, Health care indexes, Health care services, Health manpower, Health resources, *Health statistics, Indexes(Ratios), Inpatient services, Personal health services.

For these statistics of staffing and finance of the Danish hospital service, data concerning employment were obtained from the local hospital authorities, while a questionnaire was sent to each institution for the collection of particulars as to expenditure. The surveys are made up for each institution and comprise all hospitals in Denmark, irrespective of administrative status, as well as nursing homes affiliated to the mental hospitals. Moreover, a survey is given of the number of employees of other treatment institutions. In January 1978, the total hospital staff numbered 84,188 full-time employees. Detailed tables show the staff of the individual institution grouped by education or function. Tables show hospital expenditure grouped by administrative districts, type of expenditure, and administrative status. Finally, financial surveys of the individual institutions are given on the basis of statements of account for the period April 1, 1976 to December 31, 1976. Questionnaires are included. The language of this document is Danish.

HRP-0901409/3GA Not Available NTIS
National Health Service, Copenhagen (Denmark).
Ydeisesstatistik for sygehusvaesenet, 1977. (Statistics of Hospital Service Performance, 1977).
1978, 147p
Text in Danish.

Available from National Health Service, St. Kongensgade 1, DK-1264 Copenhagen K, Denmark.

Descriptors: Acute care, Communities, Data, Demography, Foreign countries, Health care indexes, Health care services, *Health statistics, Inpatient services, Mental health services, Personal health services.

The performance statistics are based on data from questionnaires sent to all hospitals in Denmark, irrespective of their administrative status, as well as to nursing homes affiliated to the mental hospitals. Information for the calendar year 1977 was thereby obtained concerning number of beds, bed occupancy, part-time patients, outpatients, and X-ray and laboratory examinations. The institutions are tabulated under the hospital district in which they are placed. From January 1977 to January 1978 the number of hospitals fell from 135 to 132. During the same period the numbers of nominated beds decreased by 0.6 percent to 43,497, 10,051 of which were in psychiatric hospitals. Discharges (including deaths) numbered 927,411 in 1977, which was an increase of 4.4 percent on the 1975/1976 figure. Hospital days numbered 12.8 million in 1977 or a fall of 2 percent. Bed occupancy fell from 82.9 to 80.6 percent, while the number of outpatients increased by 12.4 percent to 3.1 million. Detailed information about the performances of individual hospitals are given in tables and grouped by hospital districts, type of hospital, and medical branches. The statistics also include surveys on the performances of X-ray departments and clinical-chemical laboratories. Questionnaires are included. The language of this document is Danish.

HRP-0901410/1GA Not Available NTIS
Et forsorgshjems klientel -- alkoholisme og social baggrund. En undersoegelse af alle udskrevne klienter i 1977 fra forsorgshjemmet i Aarhus. (The Clientele of a Home for Destitute Persons -- Alcoholism and Social Backgrounds. An Investigation of All Clients Discharged in 1977 From the Home for the Destitute in Aarhus).
Joergen Flensted-Nielsen, Bernhard Jeune, and Svend Sabroe. 1978, 5p
Text in Danish.
Pub. in Ugeskrift for Laeger, v140, n51, p3236-3240, 18 Dec 78.

Descriptors: Accessibility, Classifications, Communities, Data, Demography, Documents, Foreign countries, Health care delivery, Health care indexes, Health care services, Health care, Health statistics, Methodology, Personal health services, Research, *Social services, Sources.

Homes for the destitute admit persons who are unable to care for themselves socially or who cannot be helped via the present social legislation in any other effective manner. There are 13 homes of this type in Denmark, and in 1977, a total of 5,283 persons stayed, on one or more occasions, in one of these homes. The present investigation was undertaken in the Home for the Destitute in Aarhus. In 1977, 1,212 discharges distributed among 483 persons were registered. Sixty percent of these were known in the home from previous admissions. The social backgrounds of the men investigated were poor; only 20 percent had fixed domiciles. A total of 373 of the individuals concerned were examined medically: 90 percent had regular drinking patterns, and 68 percent stated that they had misused alcohol for at least 10 years. Medical examination revealed a clientele in poor health. Two thirds had previously been treated in psychiatric departments and 243 were addicted to alcohol. In the analysis, a group of 105 clients who had not previously been admitted to homes for the destitute was found. Despite the fact that this group was younger than the others, the persons were socially just as wretched but were found to be in better health. It is concluded that this clientele comprises a massive social problem in Denmark. The therapeutic principles should be extended, particularly in view of the increasing number of younger persons involved. Tables and a bibliography are provided. The language of this article is Danish.

HRP-0901411/9GA Not Available NTIS
Finnish Hospital League, Helsinki.
Sairaalan tekninen huolto -- LVI-laitteiden maeaeraeaikaishuolto. (Technical Maintenance of Hospital -- Regular Maintenance of Heating, Plumbing and Ventilation Equipment).
1978, 101p
Text in Finnish; abstract in Swedish.
Available from Finnish Hospital League, Rautatielaeisenkatu 6, 00520 Helsinki 52, Finland.

Descriptors: Acute care, Administration, Health care delivery organizations, Health care facilities, Health resources, Hospital administration, Inpatient care, Patients.

This recommendation presents a system which can be used to carry out the maintenance of the heating, plumbing and ventilation equipment of a hospital at specified intervals. With suitably stepped intervals the system can be applied without personnel expansion. The maintenance system is designed for manual operation, although it is possible to modify it for computer processing, if so desired. The system comprises the following main parts: maintenance instructions, maintenance card file, maintenance tables, repair report, and machine card. Due to the construction, operations and running times of heating, plumbing and ventilation systems, the maintenance requirements of the machines included in such systems differ widely. The design of maintenance activities must always be based on the manufacturers' instructions. Maintenance instruction sets provide for maintenance cards the following items needed in servicing various devices: maintenance intervals, equipment and materials required, other special instructions, and information on the tools needed. Several of the maintenance tasks associated with heating, plumbing and ventilation equipment are of such nature that the maintenance instructions of single devices are of no use. For the designing of such system-oriented maintenance this recommendation presents the most common maintenance items specified on a system basis. Illustrations and an abstract in Swedish are provided. The language of this document is Finnish.

HRP-0901413/5GA Not Available NTIS
Medisinske aspekter ved legebemannet ambulansehelikopter. (Medical Aspects of Helicopter Rescue Operations).
Jens Moe. 1978, 4p
Text in Norwegian.
Pub. in Tidsskrift for den Norske Laegeforening, v98, n27, p1337-1340, 30 Sep 78.

Descriptors: Accessibility, Documents, *Emergency medical services, Foreign countries, Health care services, Health care, Information systems, Medical services, Methodology, Personal health services, Sources.

To improve chances of survival for emergency patients, the time from the occurrence of the emergency to the preliminary medical treatment must be as short as possible. Helicopters thus are a vital element of a complete emergency rescue service. Two-thirds of all victims of fatal traffic accidents die within 25 minutes after the accident. A survey of patients in need of prehospital resuscitation in the county of Akershus, Norway, during the past 2 years shows a badly functioning system. Since 1968, tests have been carried out as a result of an initiative taken by the German Automobile Club (ADAC). The Norwegian Automobile Club (NAF), hospitals in the Oslo area, and the Army Medical School (Lahaugmoen) have cooperated to establish a 1-year trial period for the use of an ambulance helicopter. The article includes illustrations and a bibliography. The language of this document is Norwegian.

HRP-0901414/3GA Not Available NTIS
Behovet for isolering av pasienter i sykehus. (Need for Isolation of Patients in Hospital).
Jan Sander. 1978, 4p
Text in Norwegian.
Pub. in Tidsskrift for den Norske Laegeforening, v98, n27, p1302-1305, 30 Sep 78.

Descriptors: Accessibility, Acute care, Administration, Control, Disinfection, Documents, Environmental health, Foreign countries, Health care delivery organizations, Health care facilities, Health care services, Health care, Hospital administration, Infections, Inpatient services, Methodology, Personal health services, Sanitation, Sources.

A department of infectious diseases to isolate patients from the other departments in a county hospital of 484 beds in Lillehammer, Norway is described. The hospital serves a population of 70,000 people. The isolation department has 14 beds and is integrated with the main hospital building on the eighth floor. The need for isolation of patients is evaluated by reviewing one year's experience. About 3 percent of the patients hospitalized during the year required isolation: 4.3 percent of medical patients and 3.5 percent of surgical patients. There was no epidemic during the year. The most frequent diagnosis was postoperative wound sepsis which occurred in 2.2 percent of all operations in which the skin was invaded. Half the patients admitted to the department were surgical patients. The size of the department (0.2 beds per thousand population) seemed quite adequate. Alternative ways of isolating patients in-hospital are discussed. Tables, illustrations and a bibliography are provided. The language of this document is Norwegian.

NTIS/PS-79/0864/3GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Self Care (A Bibliography with Abstracts).
Rept. for Mar 72-Jul 79,
Elizabeth A. Harrison. Sep 79, 44p*
Supersedes NTIS/PS-78/0796.

Descriptors: *Bibliographies, Patient family education, Personal health services, Consumer health education, Health education, Public health, Patient education, Preventive medicine, Therapy, Rehabilitation, Home health care, First aid, Health consumers, Elderly persons, Abstracts, Mental health care.
Identifiers: *Self care, Self help, HRP/, HRP/HB, HRP/TAA, HRP/HBE, HRP/HD.

The bibliography contains citations that discuss the lay person becoming involved in his own health promotion and prevention. Disease detection and treatment are also covered. (This updated bibliography contains 35 abstracts, 17 of which are new entries to the previous edition.)

NTIS/PS-79/0889/0GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Terminal Care (A Bibliography with Abstracts).
Rept. for 1969-Aug 79,
Elizabeth A. Harrison. Sep 79, 91p*
Supersedes NTIS/PS-78/0871.

Descriptors: *Bibliographies, *Terminal care, *Thanatology, Euthanasia, Death, Patients, Education, Medical personnel, Physicians, Nurses, Requirements, Sociology, Psychology, Psychiatry, Abstracts.
Identifiers: *Hospices, Families, HRP/KPK, HRP/TAA, HRP/RD, HRP/SCA, HRP/PA.

The selected references cover the following topics: Needs and care of dying patients and their families; psychological and social aspects of death as related to the patient dying at home or the hospital; the concept of hospice care and characteristics of hospices; the issue of euthanasia, and education for personnel caring for the dying patient. (This updated bibliography contains 83 abstracts, 36 of which are new entries to the previous edition.)

PB-298 629/7GA PC **A05**/MF **A01**
University of Southern California, Los Angeles. Dept. of Medicine.
Atherosclerosis Assessment by Angiographic Image Processing and Ultrasound.
Annual rept. Oct 78-Jun 79,
David H. Blankenhorn, Robert Barndt, Jr., Samuel H. Brooks, H. P. Chin, and Donald W. Crawford. Jul 79, 96p NIH-N01-HV-7-2930-2
Contract N01-HV-7-2930
See also report dated Jul 78, PB-288 160.

Descriptors: *Arteriosclerosis, *Ischemia, *Cardiovascular diseases, Ultrasonic frequencies, Radiology, Ultrasonic tests, Humans, Data processing, Pathology, Carotid arteries, Dogs, Tissues(Biology), Laboratory animals.
Identifiers: Assessments, Noninvasive tests, Diagnostic equipment, Image processing, Medical computer applications, *Ultrasonic imaging, *Diag-

nostic equipment, Methodology, Angiography, Femoral artery.

The research has two major goals: (1) To extend the use of image averaging of angiograms to provide non-invasive measures for atherosclerosis assessment; and (2) determination of the physical properties of human arterial tissue relative to the velocity, attenuation, and reflection of ultrasound at physiologically useful frequencies. These goals are to be achieved by radiologic studies in human cadavers which simulate venous injection conditions and contrast these with arterial injection conditions. Additional radiographic studies utilizing the canine model are to be undertaken. Determination of ultrasound physiological properties are to be conducted in human tissue removed at autopsy and canine tissue. Subsidiary goals are studies of the distribution of intracardiac calcification and relationship of coronary atherosclerosis to femoral and carotid atherosclerosis.

PB-298 761/8GA PC **A03**/MF **A01**
California Univ., San Francisco.
Abnormalities of Nervous System Function in Uremia.
Annual rept. 10 Apr 78-9 Apr 79,
Allen I. Arieff. 2 Jan 79, 35p AK-1-5-2204-79
Contract N01-AM-5-2204
See also report dated 20 Jan 78, PB-292 110.

Descriptors: *Uremia, *Nervous system disorders, *Renal failure, Experimental data, Central nervous system, Etiology, Pathology, Parathyroid hormone, Patients, Urologic diseases, Neurology, Musculoskeletal system, pH, Electrolytes, Brain, Electroencephalography, Pathophysiology, Artificial kidneys, Metabolism.
Identifiers: *Kidney diseases, Hemodialysis, Dialysis disequilibrium syndrome.

Dialysis dementia is a progressive and usually fatal neurologic syndrome in patients being treated with chronic hemodialysis. Such patients often have elevated levels of A1+3 in brain, and the high brain A1+3 might cause dialysis dementia. Studies have been carried out in 7 groups of patients and 5 groups of experimental animals. Brain A1+3 was elevated not only in patients with dialysis dementia, but also in those with either hepatic coma, metastatic cancer or acute renal failure. In animals, brain A1+3 was increased by oral loading with A1(HO)3, but this did not affect the EEG. Increased A1+3 is probably not the cause of dialysis dementia. Patients being treated with hemodialysis for the first time often manifest a syndrome characterized by emesis, nausea, headache and seizures; this syndrome has been called dialysis disequilibrium syndrome (DDS). In uremic dogs, addition of glycerol to dialysate during hemodialysis prevents most of the manifestations of experimental DDS. Glycerol was added to dialysate in 8 patients with chronic renal failure undergoing their initial hemodialysis. Using the patients as their own controls, glycerol prevented most of the manifestations of DDS. Patients with primary hyperparathyroidism (HPTH) may manifest central nervous system (CNS) abnormalities. To evaluate effects of parathyroid hormone (PTH) on CNS function, studies were carried out in patients undergoing neck surgery. The patients had EEG analysis, psychological testing and, in patients who did not survive, measurement of brain Ca+2. Pre-operative EEGs were abnormal and improved after parathyroidectomy. Thus, it appears that PTH has deleterious effects on the central nervous system in patients with HPTH.

PB-298 762/6GA PC **A03**/MF **A01**
California Univ., San Francisco. Children's Renal Center.
Comparison of Chronic Peritoneal Dialysis and Chronic Hemodialysis in Children.
Final rept. 1 Jan-31 Dec 78,
Donald E. Potter. 23 Feb 79, 28p AK-3-5-2219-79
Contract N01-AM-5-2219

Descriptors: *Renal failure, *Dialysis, Urologic diseases, Therapy, Patients, Children, Pediatrics, Growth, Evaluation, Reviews, Comparison, Health care costs, Rehabilitation, Nutrition.
Identifiers: Chronic disease management, Home health care, Health care outcomes, *Peritoneal dialysis, *Hemodialysis.

Home peritoneal dialysis (PD) was performed in four children 10-17 years of age for a mean duration of 14.8 months and center hemodialysis (HD) was performed in 21 children 1-17 years of age for a mean duration of 7.8 months. Peritonitis occurred in 0.4% of dialyses and was treated at home. The survival of peritoneal catheters, 9.7 months, was better than that of AV fistulas, 6.2 months. During dialysis there was a 33% decrease in BUN levels with PD and a 67% decrease with HD; nevertheless, predialysis BUN levels were the same in PD and HD patients. Predialysis serum Ca, P, K, C1, and albumin levels were the same in PD and HD patients; serum creatinine, Na, HCO3, and cholesterol levels were higher in PD patients. PD patients required fewer transfusions, had less hepatitis, had slightly better growth, and spent fewer days in the hospital than HD patients. Conclusion: Home PD was a practical form of therapy and was equal or superior to HD. A study of urea production during hemodialysis failed to show differences in urea production when glucose and/or amino acids were infused during the procedure.

PB-298 824/4GA PC **A04**/MF **A01**
Michigan Univ., Ann Arbor. School of Dentistry.
Studies Relative to the Degree of Effectiveness of a Combined Series of Caries Preventive Procedures in a Michigan Community.
Final rept. Jan 72-Jun 78,
Robert A. Bagramian, Charles E. Strawn, and Sujan Srivastava. Apr 79, 53p NIDR/CR-79/06
Contract N01-DE-22410

Descriptors: *Dental caries, Fluoridation, Procedures, Effectiveness, Schools, Children, Water treatment, Examination, Sealers, Prophylaxis.
Identifiers: Oral hygiene, *Preventive dentistry.

A combination of preventive procedures were utilized in a school based dental program for 5 years. 1286 students in first and sixth grades enrolled in the study. Procedures included ingestion of fluoridated water, an oral hygiene program, dental examinations, prophylaxis, acidulated phosphate fluoride gel (1.23%), application of Bis GMA pit and fissure sealant and provision of restorative care. After 3 years the treatment group was randomly divided to include a group that would not continue with treatment and serve as a comparison. Five year results for the treatment group reduced dental caries by 64% in older children and 40% in younger children. Caries reductions for the treatment comparison group were 29% for older and 24% for younger children. Sealant retention followed the same pattern of effectiveness between treatment and treatment control groups. Sealant retention ranged from a low of 2% to a high of 49%. Although sealant retention figures are not high, the basic objective of caries reduction has been significant. Results from this study are impressive when considering they are in addition to benefits received from water fluoridation.

PB-298 897/0GA PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Health Resources Div.
Military Medicine Is In Trouble: Complete Reassessment Needed.
Report to the Congress.
16 Aug 79, 86p HRD-79-107

Descriptors: *Military medicine, Surveys, Hospitals, Medical services, National government, Recommendations, Reviews, Evaluation, Statistical data.
Identifiers: Government agencies, Department of Defense, Government Accounting Office, Civilian Health and Medical Program of Uniformed Services, Medical care, Health care delivery.

Largely because of an insufficient number of physicians, the ability of the military's direct medical care system to deliver care in peace-time is seriously impaired. Some medical services have been substantially cut back at many hospitals. GAO surveyed military beneficiaries. Many were unable to obtain medical care at military hospitals, and even more had to or preferred to obtain care outside the direct care system. Of those who went outside the direct care system, most said they obtained the care they believed was necessary and that it was better or much better than the care in the direct care system. DOD agrees with GAO's basic findings and with the need for the Congress to reevaluate the role and structure of the military's direct medical care system in peacetime. GAO presents a number of alternative proposals for consideration; however, DOD believes some of them could diminish wartime contingency capability. GAO disagrees. Specific recommendations are also made to DOD for improving the direct care system's ability to serve beneficiaries.

PB-298 903/6GA PC **A04**/MF **A01**
Northwestern Univ., Evanston, IL.
Comparisons of Maintenance Peritoneal and Hemodialysis.
Final rept. 1 Jul 77-31 May 79,
David M. Roxe, and Francesco del Greco. 25 Jun 79, 61p AK-3-5-2208-F
Contract N01-AM-5-2208

Descriptors: *Uremia, *Renal failure, *Urologic diseases, *Dialysis, *Artificial kidneys, Mechanical organs, Therapy, Effectiveness, Mortality, Morbidity, Lipid metabolism, Cholesterol, Hematology, Blood chemical analysis, Electroencephalography, Cognition, Glycerides, Lipoproteins, Physiology, Neurology.
Identifiers: *Hemodialysis, *Peritoneal dialysis, Neurophysiology, Visual evoked responses.

The authors have completed a comparison of peritoneal dialysis to hemodialysis in the treatment of patients with end stage renal disease. Prospective pairing techniques were used to insure that the populations treated by each technique were genuinely comparable. Observations were made in three areas: (1) hematologic and biochemical; (2) lipid; and (3) neurophysiological. Characteristic profiles in each category were documented for each form of treatment. Certain advantages were noted for either treatment, e.g., peritoneal dialysis patients had a higher hemoglobin and hematocrit, while hemodialysis patients maintained a more normal calcium level. Peritoneal dialysis patients had a more normal level of high density lipoprotein cholesterol. Various neurophysiologic changes were recorded. The two treatments provided comparably satisfactory results for the patients. The unique profiles characteristic for each treatment provide a basis for selecting one over the other for a particular patient.

PB-298 904/4GA PC **A04**/MF **A01**
University of Southern California, Los Angeles. Div. of Nephrology.
Sexual Dysfunction in End Stage Renal Disease.
Annual rept. 30 Sep 77-28 Feb 79,
Shaul G. Massry. 1 Mar 79, 61p AK-1-7-2225-79
Contract N01-AM-7-2225

Descriptors: *Uremia, *Renal failure, Pituitary gland, Germ cells, Patients, Experimental data, Nervous system.
Identifiers: Hemodialysis, *End stage renal disease, *Sex disorders, Chronic diseases.

The study has been in progress for 17 months. In this period of time, the authors have organized a well functioning team including secretary, research nurses, psychiatrist, psychologist, statistician, endocrinologists, and nephrologists. The authors have developed efficient means of patient recruitment, clinical investigation and collection, retrieval and analysis of data. At the end of the period of this report the authors have 132 subjects at various stages of the study. They include 63 normal subjects, 24 patients with chronic illness and normal renal function, and 45 patients (26 uremic and 19 dialysis) with chronic renal failure. The data include results on nocturnal penile tumescence, psychiatric evaluations, tests for depression, blood levels of sex hormones, dynamic endocrine studies, blood levels of zinc, sperm analysis, and function of autonomic nervous system.

PB-298 940/8GA PC **A03**/MF **A01**
University of Southern California, Los Angeles. School of Medicine.
The Role of Parathyroid Hormone as a Uremic Toxin.
Annual progress rept. 22 Jul 77-30 Jan 79,
Shaul G. Massry. 1 Mar 79, 42p AK-1-7-2218-79
Contract N01-AM-7-2218

Descriptors: *Parathyroid hormone, *Uremia, *Toxins, Hormones, Toxicity, Dialysis, Renal failure, In vitro analysis, In vivo analysis, Cells(Biology), Dogs, Heart, Erythrocytes, Blood cells.

Identifiers: Chronic diseases.

The study has been in progress for 17 months. In this period, the authors have organized a well functioning team including nephrologists, a Ph.D. biochemist and well trained technicians. The authors have performed in vitro and in vivo studies. These included effect of PTH on brain ribosomal Na-K ATPase, heart cells, red blood cells, and other in vitro systems. Also the effects of PTH on peripheral nerve and on the overall uremic syndrome were studied in the dog.

PB-298 944/0GA PC **A03**/MF **A01**
Kansas Univ. Medical Center, Kansas City.
Quantitation of the Response to Erythropoietin of the Anemia in Chronic Uremic Mice with Polycystic Kidney Disease.
Final rept. 28 Dec 76-15 Jun 78,
Kurt R. Reissmann, and Alvar Werder. 15 Jun 78, 37p AK-6-2215-F
Contract N01-AM-6-2215

Descriptors: *Anemias, *Renal failure, *Uremia, Mice, Efficacy, Parenteral infusions, Humans, Erythrocytes, Blood cells, Hypoxia, Laboratory animals, Experimental data, Survival, Dosage.
Identifiers: Erythropoietin, Polyciptic kidney disease, Chronic diseases, Injections, Animal models.

A strain of mice with a high incidence of polycystic kidney (PCK) disease with chronic renal failure (CRF) was used to evaluate the efficacy of erythropoietin (Epo) injections in regard to the anemia in these PCK mice. The anemia in these mice was characterized by the same pathogenetic factors as those found in anemia of human CRF. In the more severely uremic and anemic PCK mice, the red cell life span was shortened to 46% of normal. Uremic (BUN 80 mg%) PCK mice were incapable of raising their plasma Epo to measurable levels in response to exposure to hypoxia. As measured by radioiron incorporation into RBC, the uremic PCK mice, made polycythemic by hypertransfusion, required about twice the dose of Epo in order to achieve the response seen in non-uremic controls. Daily injections of 5 units Epo over a period of 16 days restored normal or near normal red cell masses in severely anemic and uremic PCK mice. The results indicate that substitution therapy in the form of sufficiently large doses of Epo injections is capable of ameliorating the anemia of CRF in PCK mice.

PB-298 951/5GA PC **A02**/MF **A01**
Washington Univ., Seattle.
Quantitation of the Response to Erythropietin of the Anemia of Chronic Renal Disease in Sheep.
Annual progress rept. 1 Aug 77-31 Mar 78,
Joseph W. Eschbach. 7 Apr 78, 16p AK-7-2203-78
Contract N01-AM-7-2203

Descriptors: *Uremia, *Anemias, Sheep, Responses, Leukocytes, Temperature, Iron, Filters, Sensitivity.
Identifiers: *Erythropoietin, Chronic diseases, Endotoxins, Limulus test.

In an attempt to ultimately infuse sheep erythropoietin (ESF) into uremic, dialyzed sheep, 500 to 5000 units of Step I ESF (Connaught Laboratories) were infused into normal (2) and hypertransfused (1) splenectomized sheep. Ferrokinetic studies (59Fe or 55Fe) failed to show any increase in plasma or erythroid iron turnover (PIT, EIT) 12, 24, 36, 48, 72, 96 and 120 hours after infusion of 1000-5000 U of Step I ESF. A rise in temperature (from 103 to 105) after 4 hours, a drop in white blood count (from 6000 to 1000/cumm) by 6 hours, and a gradual fall in plasma iron (from 180 to 40 micrograms/dl) 15 hours after onset of ESF infusion all suggested that the ESF was pyrogenic with endotoxins (ET) and caused a reticulo-endothelial blockade limiting the availability of iron for an erythropoietic response. However, despite the presence of ET, the normal and marrow-suppressed (hypertransfused) sheep had a greater than 10-fold rise in reticulocytes and reduction in the 59Fe marrow transit time by at least 50%, indicating a significant shift of marrow reticulocytes into circulation. This effect was not observed when ET without ESF was infused.

PB-298 965/5GA PC **A02**/MF **A01**
California Univ., Los Angeles.
Studies on Respiratory Syncytial Virus Infection in the Ferret.
Annual rept. Jun 77-Jun 78,
David D. Porter, and Stephen C. Suffin. 10 Mar 78, 19p DAB-VDP-06-52
Contract N01-AI-5-2517
See also report dated 15 Mar 77, PB-294 843.

Descriptors: *Respiratory diseases, *Immunology, *Viruses, Milk, Globulins, Antibodies, Infants, Pathology, Immunity, Rodents, Experimental data, Laboratory animals, Virology, Infectious diseases.
Identifiers: Immunoglobulins, Ferrets, *Respiratory syncytial virus, Immunoglobulin G, Colostrum, Lactation.

Infant ferrets are protected from respiratory syncytial virus (RSV) replication by nursing on mothers rendered immune by a previous RSV infection. The protective substance appears to be IgG, but milk lipid carries an additional or synergistic neutralizing activity. Formalin or hypochlorite inactivated RSV vaccines induce maternal neutralizing antibody which is not protective for infant ferrets and is transferred only late during nursing. The protective effect of nursing on immune mothers is not explainable as neutralization of RSV prior to the virus reaching the target tissue for viral replication. An improved glucose oxidase immunoenzyme technique was developed and applied for the localization of RSV antigens in tissues of infected experimental animals.

PB-298 971/3GA PC **A05**/MF **A01**
Rochester Univ., NY. School of Medicine and Dentistry.
Clinical Evaluation of Respiratory Viral and Bacterial Vaccines in Children and Adults.
Annual rept. 1 Jun 76-31 May 77,
R. Gordon Douglas, Jr. 7 Mar 77, 88p DAB-VDP-05-03
Contract N01-AI-2-2503
See also report dated 5 Mar 76, PB-263 232.

Descriptors: *Vaccines, *Viruses, *Bacteria, Immunology, Immunity, Antibodies, Viral diseases, Bacterial diseases, Respiratory diseases, Infectious diseases, Parainfluenza viruses, Influenza virus, Haemophilus influenzae, Polysaccharides, Phosphorus organic compounds, Humans, Children, Adults.
Identifiers: *Respiratory syncytial virus, Reductases/ribonucleoside-diphosphate.

During a community outbreak of respiratory syncytial virus (RSV) infection, the authors showed that nosocomial spread to uninfected infants was significantly reduced when gloves, gowns, single rooms, cohorting of staff, but not masks, were used. Nosocomial influenza occurred in only eight (9%) of 87 contact infants, and in 19% of those hospitalized longer than one week. In the previous year, 32% of contact infants acquired RSV, when such measures were not used. However, RSV infection rates in staff were not reduced, 56% in the current year vs. 42% in the previous year. Studies on the mechanism of transmission of RSV revealed that RSV in infants' secretions survived for several hours on hard surfaces and hospital gowns, but only minutes on paper tissues. RSV in secretions could be transferred from hand to hand. RSV contaminated secretions on objects and skin may be important in the person-to-person transmission of RSV.

PB-298 976/2GA PC **A03**/MF **A01**
Rochester Univ. Medical Center, NY.
Studies on 'Hemophilus influenzae' b Vaccine.
Annual rept. 16 Apr 77-6 Feb 78,
Porter Anderson, Richard Insel, and David H. Smith. 6 Feb 78, 40p DAB-VDP-06-47
Contract N01-AI-7-2523
See also report dated 15 Apr 77, PB-297 238.

Descriptors: *Haemophilus influenzae, *Vaccines, Bacteria, Infants, Responses, Sex, Socioeconomic status, Humans, Children, Antibodies, Immunity, Immunology, Bacterial diseases, Infectious diseases, Bioassay.
Identifiers: Race.

In development of a vaccine against Hemophilus influenzae b radioantigen binding assays for antibody to its capsular polysaccharide, PRP, were completed on sera of experimental animals and sera from human trials. Technical improvements were made in two other types of assays. Culture conditions for recovery of PRP of higher molecular weight were established and preparation of such material as a candidate vaccine was begun. Experiments on PRP-protein complex (PC) showed that formalin did not alter endotoxic activity or immunogenicity in animals. Several types of non-formalinzed PC vaccine were provided for a human trial, the results of which indicated that the anti-PRP response was the same but toxicity somewhat greater than formalinized PC.

PB-299 022/4GA PC **A04**/MF **A01**
Ralph K. Davies Medical Center, San Francisco, CA. Dialysis Treatment and Research Center.
The Solute Kinetics of Intermittent Dialysis Therapy.
Annual rept. 1 Jan 78-1 Dec 79,
F. A. Gotch, J. A. Sargent, M. L. Keen, M. A. Lam, and M. H. Prowitt. 15 Mar 79, 72p AK-5-4-2202-79
Contract N01-AM-4-2202
See also report dated 7 Apr 78, PB-294 012.

Descriptors: *Artificial kidneys, *Dialysis, Mechanical organs, Dialyzers, Renal failure, Therapy, Solutes, Bicarbonates, Acetates, Acid base equilibrium, Metabolism, Acidosis, Proteins, Nitrogen, Biochemistry, Physiology, Transport properties, Urea, Glucose.
Identifiers: *Hemodialysis.

Methods for the measurement or estimation have been developed and evaluated for: (1) H+ generation from dietary sources relatable to protein catabolism; (2) the contribution of organic acids to H+ generation by dissociation and removal of anion; (3) dialytic loss and uptake of HCO3 during dialysis with acetate or bicarbonate dialysate; and (4) dialytic uptake and metabolism of acetate (when present in dialysate). The ability to determine these quantities has allowed us to conduct H+ balance studies and evaluate the adequacy of current treatment and the possible advantages of alternate therapy. Balance studies of current treatment (acetate dialysis) have established the accuracy of the model by verification of zero H+ balance. Similar studies with 35 mEq/L HCO3 dialysate showed -175 mEq/week/negative H+ balance during the first week of therapy change. The conclusions reached are: (1) patients dialyzed with acetate dialysate are in a chronic state of buffer acidification; (2) change to HCO3 dialysate shows partial reversal of this acidification (negative H+ balance); (3) acid-base therapy in dialyzer patient can be accurately described using the techniques developed under this contract.

PB-299 059/6GA PC **A02**/MF **A01**
Huntsville Hospital, AL.
Value of a Pneumococcal Vaccine for the Prevention of Recurrent Otitis Media in Infants.
Annual rept. Apr 77-Apr 78,
Virgil M. Howie. 7 Apr 78, 20p DAB-VDP-06-56
Contract N01-AI-5-2537
See also report dated 5 Apr 76, PB-265 208.

Descriptors: *Diplococcus, *Vaccines, *Otitis media, *Bacterial diseases, *Immunology, Polysaccharides, Infants, Ear diseases, Otitis, Age, Humans, Patients, Immunity, Preventive medicine, Immunization, Evaluation, Bacteria.

The original purpose of this five year investigation was to determine the efficacy of an octavalent pneumococcal polysaccharide vaccine in the prevention of recurrent acute otitis media in children who had already had one episode of otitis media in the first year of life. The occurrence of vaccine type otitis media, serological responses, and nasopharyngeal carriage of pneumococci and H. influenzae were also to be monitored. Since this vaccine project was started some additional information concerning the effectiveness of other polysaccharide vaccines in infants under 24 months of age has been discovered.

PB-299 102/4GA PC **A02**
Maine Univ. at Orono.
Rapid Identification of Infectious Pancreatic Necrosis Virus in Infected Cell Cultures by Immunoperoxidase Techniques,
Bruce L. Nicholson, and Eric A. Henchal. 28 Dec 77, 5p MSG/TR-38, NOAA-79071306

Descriptors: *Viruses, *Diagnosis, Identifying, Necrosis, Pancreatic diseases, Fishes, Infectious diseases, Evaluation.

Identifiers: Reprints, Cell cultures, Sea Grant program, Immunoenzyme technics.

Direct and indirect immunoperoxidase (IP) techniques were evaluated for their potential in identifying infectious pancreatic necrosis (IPN) virus. Both techniques were shown to offer a relatively simple, rapid and efficient means for the specific identification of IPN virus in infected cells. The direct IP method resulted in less nonspecific staining; however, the indirect method was clearly specific and utilized commercially available reagents.

6F. Environmental Biology

AD-A070 828/9GA PC **A03**/MF **A01**
Army Engineer Waterways Experiment Station Vicksburg MS
The White Amur as a Biological Control Agent of Aquatic Weeds in the Panama Canal.
Final rept.,
Phillip E. Custer, Francis D. Halverson, James M. Malone, Cesar Von Chong, and Russell F. Theriot. Apr 79, 40p Rept no. WES-MP-A-79-1

Descriptors: *Weed control, Aquatic plants, *Aquatic weeds, Fishes, Problem solving, Maintenance, Panama Canal.
Identifiers: *Ctenopharyhgodon idella, *Biological control.

The Panama Canal has been plagued with both floating and submerged aquatic weeds since its opening. Although more and more money has been spent on herbicides over the years, the weed problem has increased. In February 1978, the Panama Canal Company introduced the white amur fish, Ctenopharyngodon idella (Val.), as a biological tool to control the submerged macrophyte, hydrilla, to Gatun Lake, the large freshwater reservoir through which the majority of the length of the Canal passes.

AD-A070 992/3GA PC **A05**/MF **A01**
Louisville Univ KY Dept of Biology
Fate and Effects of Oil Pollutants in Extremely Cold Marine Environments.
Final rept. 1973-1979,
Ronald M. Atlas. 1 Jul 79, 80p
Contract N00014-76-C-0400

Descriptors: *Oil pollution, Oceanographic data, *Arctic Ocean, *Ecosystems, *Biodeterioration, Pollutants, Toxicity, Contamination, Hydrocarbons, Environmental protection, Oil spills, Chemical oceanography, Alaska.
Identifiers: Crude oil, Sediments, Water supply, Microorganisms, Benthos, Exposure, Invertebrates, Bioindicators, Water pollution effects(Animls).

Studies were conducted on the fate and effects of crude and refined oils in Arctic ecosystems. Major conclusions of the stufy were: (1) Microbial populations respond rapidly to an introduction of hydrocarbons into the environment by an increase of the number of hydrocarbon utilizing bacteria and a decrease in species diversity; (2) Hydrocarbons will remain in Arctic ecosystems for prolonged periods following contamination. Following initial abiotic weathering, biodegradation occur slowly. The fate depends on the particular ecosystem that is contaminated. Refined oil spillages may contaminate drinking water supplies for long periods of time; (3) Hydrocarbon biodegradation in the Arctic is limited mainly by nitrogen and phosphorus, and to a lesser extent by low temperatures. Hydrocarbon utilizing microorganisms are widely distributed; (4) When crude oil is exposed on water, biodegradation reduces absolute amounts of petroleum hydrocarbons, but does not appear to alter the relative percentages of oil components. This appears to be a major difference between petroleum biodegradation in the Arctic and in temperate regions; and (5) Petroleum contamination of Arctic sediments will result in alterations of the benthic community. Petroleum exhibits differential toxicity to benthic invertebrates.

AD-A071 141/6GA PC **A09**/MF **A01**
Department of the Army Washington DC
Blackbird Control on Army Installations.
Environmental impact statement.
Dec 74, 183p
Errata sheet inserted. See also AD-A071 144.

Descriptors: *Pest control, *Birds, Military facilities, Army, Economic analysis, Winter, Cost analysis, Environmental protection, Kentucky, Tennessee, Army planning, Agriculture, Water supplies, Aviation safety.
Identifiers: *Environmental impact statements-final, Blackbirds, Fort Campbell, Milan Army Ammunition Plant, Wetting agents.

The proposed action will locally reduce the population of grackles, cowbirds, starlings, and redwinged blackbirds. Based upon U.S. Department of the Interior analysis of blackbird populations, this local population reduction will not adversely affect the national population. The effect of the chemical application on surface and ground water, fish, nontarget birds and wildlife, plants, and humans has been considered. Under present and anticipated conditions, no adverse impact is expected. It is expected that the action will reduce agricultural damage, feed frain losses, and the potential health hazard caused by histoplasmosis. This action will also allow the Army to better discharge its responsibility toward communities in the vicinity of the project areas.

AD-A071 144/0GA PC **A12**/MF **A01**
Department of the Army Washington DC
Blackbird Control on Two Army Installations Fort Campbell, Kentucky, Milan, Tennessee AAP.
Final environmental impact statement.
Jan 75, 272p
See also Supplement dated Jan 75, AD-A071 159.

Descriptors: *Pest control, *Birds, Military facilities, Army, Cost analysis, Environmental protection, Hazards, Army planning, Water supplies, Tennessee, Kentucky, Aviation safety, Agriculture.
Identifiers: *Environmental impact statements-final, Blackbirds, Fort Campbell, Milan Army Ammunition Plant, Wetting agents.

The proposed action will locally reduce the population of grackles, cowbirds, starlings and redwinged blackbirds. Based upon U. S. Department of the Interior analysis of blackbird populations, this local population reduction will not adversely affect the national population. The effect of the chemical application on surface and ground water, fish, nontarget birds and wildlife, plants and humans has been considered. Under present and anticipated conditions, no adverse impact is expected. It is expected that the action will reduce agricultural damage, feedgrain losses and the potential health hazard caused by histoplasmosis. This action will also allow the Army to better discharge its responsibility toward communities in the vicinity of the project areas.

AD-A071 159/8GA PC **A09**/MF **A01**
Department of the Army Washington DC
Blackbird Control on Two Army Installations. Fort Campbell, Kentucky Milan, Tennessee AAP.
Final environmental impact statement.
Mar 76, 181p
Includes Supplement dated Aug 75.

Descriptors: *Pest control, *Birds, Military facilities, Army, Kentucky, Tennessee, Winter, Army planning, Cost analysis, Agriculture, Water supplies, Disease vectors, Aviation safety.
Identifiers: *Environmental impact statement-final, Blackbirds, Fort Campbell, Milan Army Ammunition Plant, Histoplasmosis, Wetting agents.

It is proposed to significantly reduce blackbird populations that have established winter roosts at Fort Campbell, Kentucky, and Milan Army Ammunition Plant (AAP), Tennessee. Blackbirds from these roosts have caused significant agricultural damage in Christian and Trigg counties, Kentucky, and Montgomery, Stewart, Gibson, and Carroll Counties, Tennessee. Additionally, these blackbird roosts have been linked with histoplasmosis-positive soil samples; tree mortality; and offensive odor, noise, and unsanitary conditions at the military installations. At Fort Campbell, vast flocks of these birds cross the airfield twice daily, interfering with aircraft operations. This action is planned to be accomplished by treating the Fort Campbell and Milan AAP roosts with Compound PA-14, Avian Stressing Agent, a biodegradable wetting agent.

BNL-25935 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Avoiding Future Health Problems Related to Solar Energy (Photovoltaic) Technology.
L. G. Stang. 1979, 25p CONF-790447-1
Contract EY-76-C-02-0016
Health implications of the new energy technologies, Park City, UT, USA, 4 Apr 1979.

Descriptors: *Solar cells, Environmental impacts, *Health hazards, Safety, Service life, Toxic materials, Toxicity, Waste disposal.
Identifiers: ERDA/140501, ERDA/140400, *Toxic substances, *Toxicology.

For abstract, see ERA citation 04:042560.

NTIS/PS-79/0885/8GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Eutrophication. Volume 3. August, 1977-July, 1979 (A Bibliography with Abstracts).
Rept. for Aug 77-Jul 79,
Elizabeth A. Harrison. Sep 79, 133p*
Supersedes NTIS/PS-78/0772, NTIS/PS-77/0687, NTIS/PS-76/0582, NTIS/PS-75/523, and NTIS/PS-74/090. See also Volume 1, 1964-1973, NTIS/PS-75/522, and Volume 2, 1974-July, 1977, NTIS/PS-78/0771.

Descriptors: *Bibliographies, *Biological productivity, Sediments, Ecology, Primary biological productivity, Limnology, Nutrients, Lakes, Water chemistry, Effluents, Abstracts, Mathematical models.
Identifiers: Water pollution control, *Eutrophication, Water pollution effects(Animals), Water pollution effects(Plants).

The selected abstracts cover all aspects of eutrophication, including research on primary productivity, water chemistry, ecology, the influence and impact of nutrients on lakes and streams, control techniques, and mathematical modeling. (This updated bibliography contains 125 abstracts, 60 of which are new entries to the previous edition.)

NTIS/PS-79/0886/2GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Aquatic Weed Control (A Bibliography with Abstracts).
Rept. for 1964-Aug 79,
Elizabeth A. Harrison. Sep 79, 195p*
Supersedes NTIS/PS-78/0870, NTIS/PS-77/0779, NTIS/PS-76/0704, and NTIS/PS-75/581.

Descriptors: *Bibliographies, *Aquatic weeds, *Weed control, Algae, Herbicides, Pest control, Algicides, Water quality, Aquatic plants, Pesticides.
Identifiers: Biological weed control, *Aquatic weed control, *Water pollution effects(Plants), *Water pollution effects(Animals).

The selected citations cover herbicide and biological weed control. The effects on water quality and ecology are discussed, as is the harvesting of these weeds. All types of weeds are covered including algae blooms. (This updated bibliography contains 185 abstracts, 25 of which are new entries to the previous edition.)

ORNL/TM-6555 PC **A05**/MF **A01**
Oak Ridge National Lab., TN.
Characterization of Nonvolatile Organics in Disinfected Wastewater Effluents: Interim Report.
R. L. Jolley, R. B. Cumming, M. S. Denton, N. E. Lee, and W. W. Pitt. Feb 79, 88p
Contract W-7405-ENG-26

Descriptors: *Bacteria, *Chlorination, *Disinfectants, *Organic wastes, *Ozone, *Waste water, Biological effects, Chemical analysis, Chemical effluents, Chemical properties, Chromatography, Experimental data, Graphs, Isolated values, Mutagenesis, Radiation effects, Salmonella typhimurium, Sewage, Thymine, Ultraviolet radiation, Uracils.
Identifiers: ERDA/520200, ERDA/550400.

For abstract, see ERA citation 04:045388.

PB-296 579/6GA PC **A17**
Southwest Research Inst., Houston, TX.
Plan for Air Pollution Research in the Texas Gulf Coast Area. Volume IV. Summary of Previous Health Effects Studies and Data.
Final rept.,

Donald E. Johnson, and R. John Prevost. Apr 79, 385p EPA/600/8-79/008D
Contract EPA-68-02-2955
See also PB-295 914.Portions of this document are not fully legible.

Descriptors: Air pollution, Demography, Public health, Socioeconomic status, Mexico Gulf, Urban areas, Rural areas, Suburban areas, Bibliographies, Abstracts, Characteristics, Plans, Populations, Texas.
Identifiers: *Texas Gulf Coast(United States), *Air pollution effects(Humans), Houston(Texas), Environmental health.

In the study reported here, a plan for air pollution research was developed for the Texas Gulf Coast Area. This report is Volume IV of a five part series of reports documenting that plan and is specifically directed at presenting relevant information on previous health effects studies and other data characteristic of the area. Background data on characteristics of area populations and industrial activities are presented and discussed, including specific socioeconomic data on twenty-two separate subregions. Results of a literature search of pertinent health effects studies are presented. Brief narrative summaries are included for ten previous studies considered most appropriate for consideration in planning further studies. An extensive bibliography is provided for other valuable references and abstracts resulting from computer searches are presented in the appendix.

PB-298 549/7GA PC **A02**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Research and Development.
Interpreting Urban Carbon Monoxide Concentrations by a Computerized COHb Model.
Journal article,
Wayne R. Ott, and David T. Mage. Sep 78, 8p
EPA/600/J-78/116
Pub. in Jnl. of the Air Pollution Control Association, v28, n9, p911-916, Sep 78.

Descriptors: *Carbon monoxide, *Air pollution, Urban areas, Computerized simulation, Mathematical models, Blood, Estimating, Concentration(Composition), Humans, Data processing, Standards, Time, California.
Identifiers: Reprints, Carboxylhemoglobin, Maximum permissible exposure, San Jose(California), Monitoring.

A practical, inexpensive computer model for estimating the level of blood carboxyhemoglobin (percent COHb) as a function of time for measured carbon monoxide concentrations (ppm CO) was developed from published studies on the assimilation of CO into the blood of human subjects. The model was designed to consider realistically the dynamic characteristics of urban CO concentrations measured continuously at air monitoring stations, and it was applied to a year's CO data measured at the San Jose, CA. air monitoring station (8760 hourly values). Accounting to the model, the National Ambient Air Quality Standards (NAAQS) for CO sometimes were violated in San Jose without exceeding 2% COHb, as well as the converse: 2% COHb was exceeded without violating the standards. The model's estimated COHb levels also provided an advance warning of impending violations of the 8-hr CO NAAQS, and analysis of the model's response to CO 'spikes' suggests that averaging periods as short as 10 or 15 minutes are necessary to serve completely the dynamic characteristics of ambient CO monitoring data. These findings suggest that the margin of safety included in the current CO NAAQS would not be the same if the actual time variation of measured CO concentrations is taken into account.

PB-298 764-T/GA PC **A25**
Department of the Interior, Washington, DC.
Ecology of the Water Vole and Its Control in West Siberia,
S. S. Folitarek. 1979, 593p TT-75-59022
Trans. of mono. Ekologiya Vodyanoi Krysy I Bor'ba S Nei V Zapadnoi Sibiri, Novosibirsk, 1971. Sponsored in part by National Science Foundation, Washington, DC. Special Foreign Currency Science Information Program.

Descriptors: *Aquatic animals, *Rodents, *Animal ecology, Pest control, Tularemia, Books, Damage, Farm crops, Chemical properties, Reproduction(Biology), Cultivation, Siberia, Translations, Bacteria, Aerial reconnaissance, Spraying, Poisons.
Identifiers: *Biological pest control, Trichophyton gypseum, Bait.

Water vole, in West Siberia, is more highly abundant than in other regions of USSR. There, it causes great damage and loss of agricultural crops and forest plantations; and represents the main source of tularemia; a very dangerous disease to both man and animal. The control of these rodents, particularly during the years of their intensive reproduction, fulfills all necessities for agriculture, forest and hunting economics together with counter-epidemic services. The present collection includes papers dealing with the ecology of water vole and the improvement of means of its control. The more recently developed methods viz. aerodeceiving, bacteriological and other methods of control, of water vole are included.

PB-298 856/6GA PC **A05**/MF **A01**
National Power Plant Team, Ann Arbor, MI.
An Empirical Transport Model for Evaluating Entrainment of Aquatic Organisms by Power Plants.
John Boreman, C. Phillip Goodyear, and Sigurd W. Christensen. Nov 78, 83p* FWS/OBS-78/90
Prepared in cooperation with Oak Ridge National Lab., TN. Errata sheet inserted.

Descriptors: *Entrainment, *Aquatic animals, *Electric power plants, Mortality, Evaluation, Mathematical models, Steam electric power generation, Survival, Distribution, Experimental data, Abundance, Estimating, Fishes, Shellfish.

A generalized mathematical model for estimating conditional entrainment mortality. Operation of the model relies on knowledge of the morphometry of the water body; power plant flow rates; the probability of surviving entrainment; and the duration, distribution, and abundance of entrainable life stages.

PNL-2850(Pt.2) PC **A08**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Pacific Northwest Laboratory Annual Report for 1978 to the DOE Assistant Secretary for Environment. Part 2. Ecological Sciences.
B. E. Vaughan. Feb 79, 166p
Contract EY-76-C-06-1830

Descriptors: *Hanford reservation, *Aquatic ecosystems, Land use, Leading abstract, Terrestrial ecosystems.
Identifiers: ERDA/520200, ERDA/510200, ERDA/520300, ERDA/510300, Abstracts.

For abstract, see ERA citation 04:045391.

6H. Food

see individual report for order number and price
Flavor and Extract Manufacturers' Association of the United States, Washington, DC.
Scientific Literature Review of Substances in Flavor Usage.
Final rept. 1920-78.
1979,open series

The monographs contain a collection of data from the published literature from 1920 to date. Unpublished data from private industry files are also contained in the monograph. These data cover the specific group of structurally related compounds designated in the title. Included in the review are data on toxicity and metabolism, usage and natural occurrence in foods, and compositional specifications. Other individual documents are also available:

FDA/BF-79/116. Propylene Glycol, Glycerol and related Substances. Second Supplement. Apr 79, 10p PC A02, MF A01 **PB-298 376/5GA**
FDA/BF-79/117. Furanones and Related Substances. First Supplement. Apr 79, 14p PC A02, MF A01 **PB-298 377/3GA**
FDA/BF-79/118. Sulfur Derivatives of Furans. First Supplement. Apr 79, 14p PC A02, MF A01 **PB-298 378/1GA**
FDA/BF-79/119. Thiazole and Related Substances. First Supplement. Apr 79, 16p PC A02, MF A01 **PB-298 379/9GA**
FDA/BF-79/120. Aryl Substituted Tertiary Alcohols and Esters. First Supplement. Apr 79, 9p PC A02, MF A01 **PB-298 380/7GA**
FDA/BF-79/121. Aliphatic Polyhydroxy Compounds and Derivatives. First Supplement. Apr 79, 8p PC A02, MF A01 **PB-298 381/5GA**
FDA/BF-79/122. Primary Alcohols, Aldehydes, Acids and Related Esters with Thiol or Sulfide Functions. First Supplement. Apr 79, 10p PC A02, MF A01 **PB-298 382/3GA**
FDA/BF-79/123. Aliphatic Primary Alcohols, Aldehydes, Esters and Acids. Fifth Supplement. Apr 79, 36p PC A03, MF A01 **PB-298 383/1GA**
FDA/BF-79/124. Aliphatic Lactones. First Supplement. Apr 79, 17p PC A02, MF A01 **PB-298 384/9GA**
FDA/BF-79/125. Alicyclic Compounds of Carbon, Hydrogen and Oxygen. Fourth Supplement. Apr 79, 30p PC A03, MF A01 **PB-298 385/6GA**
FDA/BF-79/126. Phenols. First Supplement. Apr 79, 11p PC A02, MF A01 **PB-298 386/4GA**
FDA/BF-79/127. Substituted Pyrazines. Second Supplement. Apr 79, 10p PC A02, MF A01 **PB-298 387/2GA**
FDA/BF-79/128. Aliphatic Ketones, Secondary Alcohols and Related Esters. Second Supplement. Apr 79, 18p PC A02, MF A01 **PB-298 388/0GA**

6J. Industrial (Occupational) Medicine

PB-298 332/8GA PC **A09**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH. Div. of Labs. and Criteria Development.
Safety Program Practices in High versus Low Accident Rate Companies - An Interim Report (Questionnaire Phase),
Alexander Cohen, Michael Smith, and H. Harvey Cohen. Jun 75, 190p DHEW/PUB/NIOSH-75/185

Descriptors: *Questionnaires, *Industrial accidents, Industrial plants, Safety, Rates(per time), Data processing, Programs, Responses.
Identifiers: *Occupational safety and health, *Health surveys.

The report describes a questionnaire used to define the difference in safety program practices in factories with low and those with high accident rates. Pairs of factories in Wisconsin were chosen for the study. The members of each pair were comparable in type of operation, workforce size, and locale, but differed by at least 2 to 1 in the incidence to recordable injuries during 1972. The factories were selected from six different types of industries; food and kindred products, wood products, paper products, primary metals, fabricated metals and machinery manufacture. Descriptive and statistical analyses were performed on the data which suggested that companies had a low accident rate; greater stature and staff commitment given to company safety efforts, used more outside influence to install safety consciousness in workers, used a variety of safety promotion and incentive techniques, greater opportunities for general and specialized job safety training, a more humanistic approach toward disciplining risktakers and violators of safety rules, more frequent, though formal inspections of the workplace, more safety programs that emphasized both engineering and non-engineering approaches to accident prevention, and more stable qualities in the makeup of the workplace.

PB-298 342/7GA PC **A13**/MF **A01**
De Leuw, Cather-Parsons and Associates, Washington, DC.
Northeast Corridor Improvement Project Task 406: General Safety Requirements.
Final rept.
Jun 78, 296p F406-88, FRA/NEPCO-78/10
Contract DOT-FR-76048

Descriptors: *Safety, *Manuals, Illuminating, First aid, Requirements, Procedures, United States,

Standards, Qualifications, Blasting, Demolition, Fire protection, Welding, Cutting, Tools, Rope, Chains, Reporting, Sanitation, Personnel, Plans, Protective clothing, Poisons, Fire prevention, Materials handling, Storage, Disposal.
Identifiers: Toxic substances, Northeast Corridor, Occupational Safety and Health Administration, Health care facilities, Emergency medical services.

The General Safety Requirements specifies the safety rules and procedures regulating construction and trackwork for the Northeast Corridor Improvement Project. These rules and procedures are to be followed by Amtrak and all contractors performing work on the Northeast Corridor rail system, and all architect-engineer personnel and other visitors to work sites.

PB-298 561/2GA PC **A12**/MF **A01**
National Inst. for Occupational Safety and Health, Cincinnati, OH.
A Guide to the Work-Relatedness of Disease, Revised Edition,
Stanley Kusnetz, and Marilyn K. Hutchison. Jan 79, 271p* DHEW/PUB/NIOSH-79/116
Revision of report dated 1976. See also report dated 1976, PB-273 837.

Descriptors: *Occupational diseases, *Industrial medicine, Medical records, Workmens compensation, Industrial hygiene, Industrial atmospheres, Etiology, Guidelines, Epidemiology, Carbon monoxide, Exposure, Decision making, Coking, Emission, Cotton fabrics, Dust, Lead(Metal), Mercury(Metal), Nitrogen dioxide, Noise(Sound), Diisocyanates, Toluene.
Identifiers: *Occupational safety and health, Toxic substances.

The monograph outlines and describes a method for the collection, presentation, and evaluation of medical, occupational, and other evidence of disease in the workplace. Selected information is presented on fourteen disease-producing agents to illustrate the collection methodology and to present, and evaluate the data. Some problem areas associated with decision-making are also discussed. The fourteen agents considered are: antimony; carbon monoxide; coke oven emissions; cotton dust; inorganic lead; inorganic mercury; nitrogen dioxide; noise; crystalline silica; sulfur dioxide; and toluene diisocyanate.

PB-298 747/7GA PC **A15**/MF **A01**
Seltzer (Curtis), Cabin John, MD.
Surveying and Analyzing the Field of Employee Rights Related to Occupational Disease.
Final rept. Dec 78-Mar 79,
Curtis Seltzer. Mar 79, 342p ASPER/PUR-79/2220/A
Contract DL-B-9-M-9-2220

Descriptors: *Occupational diseases, *Industrial medicine, Personnel, Development, Surveys, Analyzing, Industrial relations, Safety, Labor unions, National government, Great Britain, Sweden, Hazards, Foreign countries.
Identifiers: Toxic substances, *Occupational safety and health, *Employees rights, Occupational Safety and Health Administration.

The development of employee rights related to occupational health and safety under law and union contract is surveyed and analyzed. The historical development of these rights is traced and quantification is provided for 1976 based on BLS data and contractor analysis. Rights under OSHA and MSHA are compared and two--the right to refuse hazardous work and the right to monitor for harmful substances--are examined in detail. The development of employee rights in the UK and Sweden is explored. Interviews with union decision-makers were conducted regarding emerging trends in this field, and the results included.

6L. Medical and Hospital Equipment

AD-A070 587/1GA MF **A01**
Veterans Administration Washington DC Dept of Medicine and Surgery
Bulletin of Prosthetics Research. Spring 1979,
Eugene F. Murphy. 1979, 494p Rept no. BPR-10-31
Availability: Superintendent of Documents, GPO, Washington, DC 20402 HC $4.50. Microfiche furnished to DDC (and NTIS) users.

Descriptors: *Handbooks, *Prosthetics, Artificial limbs, Mechanical organs, Medical research, Rehabilitation, Medical equipment, Chairs.

No abstract available.

AD-A070 647/3GA Not available NTIS
State Univ of New York at Buffalo Dept of Physiology
Hydrostatic Pressure and Mammalian Cardiac-Pacemaker Function,
H. Ch. Oenhagen, and P. M. Hogan. 1977, 12p
Contracts N00014-71-C-0342, N00014-76-C-0472
Abstract in French.
Availability: Pub. in Undersea Biomedical Jnl., v4 n4 p347-358 Dec 77. (No copies furnished by DDC).

Descriptors: *Pacemakers, *Hydrostatic pressure, Mammals, Hyperbaric chambers, Reprints.
Identifiers: *Hyperbaric bradycardia.

No abstract available.

AD-A071 148/1GA PC **A02**/MF **A01**
School of Aerospace Medicine Brooks AFB TX
Measured Effects of 450-, 350-, and 250-MHz Pulsed and 26-MHz CW Radiofrequency Fields on Cardiac Pacemakers.
Final rept. Jul 76-Oct 78,
Kenneth A. Hardy. Jun 79, 10p Rept no. SAM-TR-79-20

Descriptors: *Pacemakers, *Radiation effects, Radiofrequency, Electromagnetic interference, Continuous waves, High frequency, Very high frequency, Ultrahigh frequency, Radiation hazards, Pulse rate, Test and evaluation, Microwaves.

Tests were performed to measure the effects of 450-, 350-, and 250-MHz pulsed and 26-MHz CW radiofrequency radiation cardic pacemakers. Thirty-three pacemaker models from fourteen different manufacturers were tested both in a free field and simulated implant configuration. The test results presented indicated that the majority fo the manufacturers represented had succeeded in producing EMI-resistant pacemakers. (Author)

PB-298 463/1GA PC **A03**/MF **A01**
Thoratec Labs. Corp., Emeryville, CA.
Fabrication of Implantable Artificial Heart Devices and Components.
Final rept. Apr 78-Jun 79,
Karl O. Hall, Jerome A. G. Russell, Keith E. Buck, and Philip Litwak. Jul 79, 41p NIH-N01-HV-1-2035-8
Contract N01-HV-1-2035
See also report dated Apr 78, PB-282 799.

Descriptors: *Mechanical hearts, Mechanical organs, Tables(Data), Fabrication, In vivo analysis, In vitro analysis, Design, Bioengineering, Humans, Implantation, Performance evaluation, Laboratory animals.
Identifiers: *Cardiac assist devices, *Left ventricular assist devices, Cadavers.

During this final year of NO1-HV-1-2035, Thoratec Laboratories fabricated 53 Model VI LVAD assemblies, along with various components. In addition to this manufacturing activity, the Plate Position Sensor was developed and refined so that the animal testing pneumatic driver system can supplant gas losses in the pneumatic circuit and also adapt the pumping characteristics to variations in the animal's blood pressure. A toxicity study revealed the safety of the materials from which the LVAD components are formed. Thoratec distributed assemblies and components to Andros, Gould, Aerojet and the Institutes of Medical Sciences. A packet of drawings and procedures was provided to the Program Office as well. A project to supply major LVAD components fabricated from titanium was completed and a study to characterize polymer-to-metal bonding techniques initiated. The tests of those LVAD bladders which had undergone a successful two-and-one-half year in vitro endurance testing were voluntarily ended.

PB-298 757/6GA Not available NTIS
National Bureau of Standards, Washington, DC.
Durability of the Bond Between Bone and Various 2-Cyanoacrylates in an Aqueous Environment.
Final rept.,
G. M. Brauer, J. W. Kumpula, D. J. Termini, and K. M. Davidson. 1979, 14p
Sponsored in part by National Inst. of Dental Research, Bethesda, MD.
Pub. in Jnl. Biomed. Material Research, v13 p593-606, 1979.

Descriptors: *Bones, *Bonding, Durability, Water, Esters, Strength.
Identifiers: *Acrylic acid/cyano, Reprints.

The durability of the bond strength developed between 2-cyanoacrylate esters and bone has been determined by aging specimens in water. One-day bond strength of the isobutyl and isomeric amyl 2-cyanoacrylates varied from 6.2 to 7.2 MPa. The strength of the bond decreased on storage or on thermocycling in water. Hydrolytic stability increased with increasing length of the alkyl ester group. After a six-month storage in water the various amyl 2-cyanoacrylates retained from 70% to 73% of their one-day bond strength. Pretreatment of the bone surface prior to application of the adhesive did not prove beneficial. The cured 2-cyanoacrylate can be removed from the substrate surface by appropriate solvents. Thus, it is not bonded covalently to bone. The bond strength, especially of the isobutyl and amyl 2-cyanoacrylates to bone in an aqueous environment, appears to be superior to other adhesives. Provided these monomers are biocompatible, they may be useful clinically where an intermediate-term adhesion is desired.

6M. Microbiology:

AD-A070 653/1GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Culture of Human Malaria Parasites Plasmodium Falciparum,
J. David Haynes, Carter L. Diggs, Fred A. Hines, and Robert E. Desjardins. 2 Jul 76, 3p
Pub. in Nature, v263 n5580 p767-769, 28 Oct 76.

Descriptors: *Plasmodium falciparum, *Malaria, *Parasites, Vaccines, Antigens, Erythrocytes, Reprints.

No abstract available.

AD-A070 983/2GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Ecology, Serology, and Enterotoxin Production of 'Vibrio Cholera' in Chesapeake Bay.
Medical research progress rept.,
J. Kaper, H. Lockman, R. R. Colwell, and S. W. Joseph. 10 Oct 78, 16p Rept no. NMRI-79-10
Pub. in Applied and Environmental Microbiology, v37 n1 p91-103 Jan 79.

Descriptors: *Cholera, Enterotoxins, Ecology, Serology, Bacteriology, Salinity, Production, Chesapeake Bay, Sampling, Isolation, Reprints.
Identifiers: *Vibrio cholerae, *Bacteria.

No abstract available.

6N. Personnel Selection and Maintenance (Medical)

AD-A070 732/3GA PC **A06**/MF **A01**
Anthropology Research Project Inc Yellow Springs OH
Revised Height/Weight Sizing Programs for Men's Protective Flight Garments.
Technical rept.,
Milton Alexander, John T. McConville, and Ilse Tebbetts. Apr 79, 117p AMRL-TR-79-28
Contract F33615-78-C-0508

Descriptors: *Anthropometry, *Protective clothing, Height, Body weight, Statistical data, Air Force personnel, Tables(Data).

Presented in this report is an updated series of height/weight sizing programs for use by designers of protective clothing for USAF men. The sizing values are based on an analysis of data obtained in the 1967 survey of flying personnel and cover some 71 dimensions (excluding head, hand and foot measurements).

6O. Pharmacology

AD-A070 655/6GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Changes in Brain Levels of Cyclic Nucleotides and gamma-Aminobutyric Acid in Barbiturate Dependence and Withdrawal,
Robert H. Lenox, H. Linton Wray, G. Jean Kant, T. Daryl Hawkins, and James L. Meyerhoff. 19 Oct 78, 13p
Pub. in European Jnl. of Pharmacology, v55 p159-169 1979.

Descriptors: *Barbiturates, *Drug tolerance, Drug withdrawal, Central nervous system, Nucleotides, Reprints.

No abstract available.

AD-A070 817/2GA PC **A04**/MF **A01**
Analytic Services Inc Arlington VA
Interview Evaluation of the Datastat Outpatient Pharmacy System at Naval Regional Medical Center Charleston.
Evaluation rept.,
Jonathan D. Hodgdon. Jul 78, 65p Rept no. ANSER-HSDN-78-2
Contract MDA903-78-C-0085

Descriptors: *Information systems, Pharmacies, Information retrieval, Interviewing, Automation, Pharmacists, Perception(Psychology), Performance tests, Benefits.
Identifiers: DataStat.

The DataStat Outpatient Pharmacy System is designed to improve and expand pharmacy operations by performing such functions as the printing of labels and reports, patient profiling, interaction monitoring, and inventory control. In December of 1977, the Naval Regional Medical Center at Charleston, S.C., became the first U.S. military hospital to implement DataStat. This paper presents the results of interviews conducted in March 1978 with the pharmacy staff at NRMC Charleston to obtain their subjective assessments of the performance and impacts to date of the automated outpatient system.

AD-A070 985/7GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Plasmodium berghei: Phase Contrast and Electron Microscopical Evidence That Certain Antimalarials Can Both Inhibit and Reverse Pigment Clumping Caused by Chloroquine,
Albert Einheber, Douglas M. Palmer, and Masamichi Aikawa. 17 Sep 75, 12p
Pub. in Experimental Parasitology, v40 p52-61 1976.

Descriptors: *Antimalarials, *Quinine, *Chloroquine, Malaria, *Plasmodium berghei, Electron microscopy, Mice, Reprints.

No abstract available.

AD-A070 993/1GA PC **A02**/MF **A01**
Albert Einstein Medical Center Philadelphia PA Radiation Research Lab
The Distribution and Metabolism of the Radiation Protective Agent Aminopropylaminoethyl-Phosphorothioate (WR-2721) in Mice.
Final rept. Jul 67-Jun 72,
George Kollmann, Bernard Shapiro, Shalom Leon, and David Martin. May 78, 22p
Contract DADA17-67-C-7165

Descriptors: *Radioprotective agents, Phosphorothioates, Metabolism, Tissues(Biology), Toxicity, Mice, Kidneys, In vivo analysis.
Identifiers: Aminopropylaminoethyl-phosphorothioate, Labeled substances, Distribution, Laboratory animals.

Aminopropylaminoethyl-phosphorothioate (WR-2721) is the least toxic and most effective of the phosphorothioate class of radiation protective agents. In order to investigate the mechanism of action of this agent, distribution and metabolism studies were carried out using 35S-labelled WR-2721. In mice given WR-2721 intraperitoneally, tissue analysis showed only the unchanged compound and the protective agent bound to proteins by mixed disulfide bond. Concentration of the latter form correlated best with the time course of protection. Dephosphorylation to yield the thiol form of WR-2721, necessary for mixed disulfide formation on tissue proteins, was best demonstrated in the kidneys, both in vivo and in vitro, but also occurs in other tissues. Preliminary studies with the disulfide and thiol forms of WR-2721, which are less protective and more toxic than the phosphorothioate, suggest that the presence of the phosphate is necessary to mask the sulfhydryl group during transport to the target site. Formation of a mixed disulfide with tissue protein sulfhydryl groups at the target site appears to yield the final necessary condition for radiation protection. (Author)

AD-A071 164/8GA PC **A02**/MF **A01**
Texas Univ Health Science Center at San Antonio Dept of Pharmacology
The Effects of Haloperidol on Ouabain Cardiac Inotropy and Toxicity,
A. H. Briggs, and L. J. Delallo. 25 Jul 77, 5p AFOSR-TR-79-0794
Grant AFOSR-76-3029
Pub. in Proceedings of the Society for Experimental Biology and Medicine, v158 p192-195 1978.

Descriptors: *Drugs, *Glycosides, *Dopamine, Cardiac glycosides, Nerve blocking, Toxicity, Digitalis, Reprints.
Identifiers: *Haloperidol, *Ouabain, *Toxicology.

No abstract available.

6P. Physiology

AD-A070 589/7GA PC **A02**/MF **A01**
New York Univ Medical Center NY
Human Platelet Senescence.
Annual rept. no. 8, 1 May 76-30 Jun 77,
Simon Karpatkin. 18 Jul 78, 20p
Contract DADA17-68-C-8163

Descriptors: *Blood platelets, Heterogeneity, Production, Aging(Physiology), Humans, Rabbits, Tables(Data).
Identifiers: *Megathrombocytes.

Evidence that large-heavy platelets (megathrombocytes) are released early from the bone marrow and become smaller-lighter platelets with time under basal conditions. Heterogeneity of platelet protein content as determined by SDS-polyacrylamide gel electrophoresis of cell sap proteins of various platelet populations isolated by differential centrifugation in plasma. Heterogeneity of platelet monoamine oxidase activity: correlation with platelet protein density. Evidence that megathrombocyte number determines platelet function and that significant numbers of megathrombocytes are routinely discarded by conventional methods of preparation of platelet-rich plasma. Evidence that intact microtubules are required for platelet aggregation.

AD-A070 646/5GA Not available NTIS
State Univ of New York at Buffalo Dept of Physiology
Diffusion in the Gas Phase: the Effects of Ambient Pressure and Gas Composition.
C. V. Paganelli, A. Ar, H. Rahn, and O. D. Wangensteen. 16 Jul 75, 12p
Contracts N00014-68-A-0216, N00014-76-C-0472
Availability: Pub. in Respiration Physiology, v25 p247-258 1975. (No copies furnished by DDC).

Descriptors: *Membranes(Biology), Gas flow, Diffusion coefficient, Eggs, Chickens, Transport properties, Porosity, Reprints.

No abstract available.

AD-A070 649/9GA Not available NTIS
State Univ of New York at Buffalo Dept of Physiology
Effects of Hydrostatic Pressure on Conduction and Excitability in Rabbit Atria,
Thomas J. Doubt, and Perry M. Hogan. 6 Jan 78, 10p
Contracts N00014-71-C-0342, N00014-76-C-0472
Availability: Pub. in Jnl. of Applied Physiology; Respiratory Environmental Exercise Physiology, v45 n1 p24-32 1978. (No copies furnished by DDC).

Descriptors: *Hydrostatic pressure, Tolerances(Physiology), Heart rate, Physiological effects, Exposure(Physiology), Hyperbaric chambers, Rabbits, Reprints.
Identifiers: *Stress(Physiology), Laboratory animals.

No abstract available.

AD-A070 657/2GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Study of the Delay Phenomenon in Axial Pattern Flaps in Pigs,
Alexander M. Guba, Jr. 1979, 7p
Presented at the Annual Meeting of the Plastic Surgery Research Council, Richmond, VA., 26 May 78. Pub. in Plastic and Reconstructive Surgery, v63 n4 p550-554 Apr 79.

Descriptors: *Blood circulation, Microspheres, Radioactivity, Delay, Measurement, Survival(General), Skin tests, Reprints, Swine, Laboratory animals.
Identifiers: *Axial pattern flaps.

No abstract available.

AD-A070 751/3GA PC **A02**/MF **A01**
Naval School of Aviation Medicine Pensacola FL
Peak Rates of Oxygen Flow from Oxygen Supply Systems.
Research rept. no. 1,
J. H. Weatherby, and Agnes S. Burt. 1944, 17p

Descriptors: *Respiration, *Oxygen consumption, *Rest, *Exercise(Physiology), Volume, Oxygen, Measurement, Gas flow.
Identifiers: Males.

Maximum rates of flow of oxygen required by a group of 10 men supplied from a single system were determined for conditions of rest and moderate exercise. Under the conditions indicated, maximum rates of flow were as follows: (1) rest, random group breathing, 141 liters per minute. (2) rest, rhythmic group breathing, 220 liters per minute. (3) exercise, random group breathing, 415 liters per minute. (4) exercise, rhythmic group breathing, 445 liters per minute. Respiratory minute volumes during exercise were determined on individual subjects receiving oxygen from systems capable of maximum rates of flow of 52 and 75 liters per minute respectively. With a mean minute volume of 19.2 liters per minute, the ratio, maximum rate of flow divided by minute volume (M.F./M.V.) was found to be 2.8 when determined on 19 subjects. With a mean minute volume of 29.6 liters per minute, M.F./M.V. was found to be 2.6 when determined on 11 subjects. (Author)

AD-A070 880/0GA PC **A04**/MF **A01**
Letterman Army Inst of Research San Francisco CA
Evaluation of Calorie Requirements for Ranger Training at Fort Benning, Georgia.
Final rept. Jul 73-Jun 76,
Herman L. Johnson, Harry J. Krzywicki, John E. Canham, James H. Skala, and Ted A. Daws. Jul 76, 54p Rept no. LAIR-34

Descriptors: *Military requirements, *Physical fitness, Nutrition, Test and evaluation, Body weight, Diet, Performance(Human), Exercise(Physiology), Army training, Weight reduction.
Identifiers: *Calories.

In response to a request to evaluate the requirement for an increased ration allowance for trainees by the Ranger Department, United States Army, a study was conducted throughout one training cycle on the men enrolled in the course. Body weights, skinfold thicknesses, selected body circumferences, and urinary chemistry values were measured several times from pretraining until graduation. Treadmill performance tests were conducted, blood samples were obtained for analysis, and additional anthropometric parameters were measured pre and post training.

AD-A071 019/4GA PC **A03**/MF **A01**
Tuskegee Inst AL Dept of Physics
Analytical Modelling of Load-Deflection Behavior of Intervertebral Discs Subjected to Axial Compression.
Final research rept. 1 Apr 71-31 May 79,

Marshall L. Burns. 31 May 79, 26p AFOSR-TR-79-0795
Grant AFOSR-78-3578

Descriptors: *Spinal column, *Compression, Mathematical models, Axisymmetric, Analytic functions, Modulus of elasticity, Viscosity, Stress strain relations, Biophysics, Creep, Analog systems.

The analytical modelling of creep response phenomena of intervertebral discs subjected to a constant axial compressive load is attempted by using Kelvin-solid models. A mathematical analysis scheme is proposed for unique model identification wherein exact parameter solutions are developed for the one-Kelvin-unit model, the three-parameter-solid model, and the two-Kelvin-unit model. In addition, a method is presented by which the associated Young's moduli and viscosity coefficients for an identified model are obtainable. Most importantly, unique parameter values are obtained for the three-parameter-solid by utilizing exact model parameter solutions on experimental strain, E (t), data. This particular model is observed to yield theoretical strain, E (t)cal, values that are within an average error of 3.48% of the experimentally measured values, E (t)exp, for different intervertebral discs. Further, mechanical properties of the intervertebral discs are obtained by using the values of the three-parameter-solid model parameters to calculate the associated Young's moduli and viscosity coefficient. The appropriate applications, data limitations, and possible generalizations of this exact analysis scheme are fully discussed, along with suggestions for future investigatory efforts. (Author)

AD-A071 170/5GA PC **A08**/MF **A01**
Ohio State Univ Columbus Dept of Engineering Mechanics
Measurement of Resistive Torques in Major Human Joints.
Final rept. 1 Apr 76-30 Sep 78,
Ali Erkan Engin. Apr 79, 156p AMRL-TR-79-4
Contracts F33615-76-C-0505, DOT-HS-6-01331

Descriptors: *Joints(Anatomy), *Torque, *Biomechanics, Measurement, Shoulders(Anatomy), Knee(Anatomy), Hip, Motion, Equations.
Identifiers: Elbow(Anatomy), Ankle.

The major articulating joints which are considered are the shoulder, knee, hip, elbow and ankle. Due to drastic postmortem changes of the biomechanical response of the body tissues, the research is conducted with some obvious limitations on live human subjects. The major components of the specially designed and built experimental apparatus are a subject restraint system, a global force applicator (GFA), and an exoskeletal device (ESD). The ESD is used in monitoring the kinematics of the motion between the fixed and the moving body segments and the forces are applied to the moving body segment by means of the GFA. Design of both the ESD and GFA are similar, each containing eight high precision potentiometers. The experimental apparatus and the associated theoretical concepts are utilized to achieve at least three major tasks. These tasks are the quantitative determination of (a) the voluntary range of motion (b) the resistive force and moments (c) the resistive torques for the rotational motion of the body segments about their long bone axes. Although the majority of the results presented are on the passive resistive force, moment and torques for the major articulating joints of three subjects, some results on the magnitudes of the active resistive muscle force, moment and torque vectors are also presented for the same subjects.

NTIS/PS-79/0857/7GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Altitude Acclimatization (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Aug 79, 31p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Bibliographies, *Acclimatization, Stress(Physiology), Altitude, Environments, Hypoxia, Heart, Blood circulation, Humans, Responses, Exercise(Physiology), Tolerances(Physiology), Oxygen consumption.

The bibliography of citations to the international literature covers all aspects of altitude acclimatization. Included are articles concerning high altitude environments, hypoxia, heart function and hemodynamic responses, physical exercise, human tolerances and reactions, physiological responses, and oxygen consumption. (Contains 129 citations)

PB-298 456/5GA PC **A02**/MF **A01**
Milton S. Hershey Medical Center, Hershey, PA.
Fetal and Infantile Development of Oral Sensory Receptors in Primates: Microscopic and Ultramicroscopic Histology.
Final rept. 27 Feb 72-25 Feb 77,
Bryce L. Munger. 20 Mar 79, 21p NIDR/CR-79/07
Contract N01-DE-2-2401

Descriptors: *Senses, *Sense organs, *Infants, Development, Rhesus monkeys, Maturation, Skin(Anatomy), Microscopy, Histology, Mouth, Tongue.
Identifiers: Fetuses.

The study documented the sequence of maturation of sensory receptors in oral mucosa contrasting the maturational development in upper and lower lip with that of the tip of the tongue and the mucosa overlying the hard palate. A specific sequence of maturation of sensory receptors was documented including a precocious differentiation of sensory receptors in the mucosa overlying the hard palate. This region was subsequently determined to be important in masticatory reflexes in the newborn rhesus monkey.

UR-3490-1539 PC **A02**/MF **A01**
Rochester Univ., NY. School of Medicine and Dentistry.
Metal Binding by Intestinal Mucus.
J. R. Coleman, and L. B. Young. 1978, 15p CONF-790418-5
Contract EY-76-C-02-3490
Scanning electron microscopy conference, Washington, DC, USA, 16 Apr 1979, Portions of document are illegible.

Descriptors: *Cadmium, *Lead, *Mercury, *Mucous membranes, *Zinc, Binding energy, Biological effects, Chemical analysis, Electron probes, Intestines, Secretion.
Identifiers: ERDA/560305.

For abstract, see ERA citation 04:043847.

6Q. Protective Equipment

AD-A071 154/9GA PC **A06**/MF **A01**
MSA Research Corp Evans City PA
Feasibility Study of Self-Contained Environmental Control Unit.
Final rept.,
M. J. McGoff, and J. W. Mausteller. Nov 78, 116p MSAR-78-58, USCG-D-04-79
Contract DOT-CG-73210-A

Descriptors: *Water pollution, *Hazardous materials, *Protective equipment, Self contained, Feasibility studies, State of the art, Coast guard research, Environmental protection.
Identifiers: Protective Outfit Toxicological Microclimate Control, Environmental Control Unit, Feasibility studies.

This feasibility study pertained to defining requirements, surveying available equipment, devising and evaluating concepts, and making recommendations for development of a self-contained environmental control unit. A modular approach with field replacement is deemed necessary to conserve weight; otherwise, the ECU weight and bulk becomes cumbersome. Adoption of a head/vest water cooled undergarment with ice canisters for heat sinking is advised over use of filtered air cooling. A self-contained rebreather apparatus with a mask inside a protective helmet is recommended as a breathing supply. Both cooling and breathing modules are recommended to be located external to the protective suit. Use of the present POTMC protective suit with the modular ECU concept appears feasible, but evaluation will be required. (Author)

6R. Radiobiology

AECL-6306 PC **A03**/MF **A01**
Atomic Energy of Canada Ltd., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
TERMOD II: An Interactive Code for Analyzing Intake of Radionuclides by Man Through Terrestrial Pathways.
R. Zach. Nov 78, 39p
U.S. Sales Only.

Descriptors: Computer codes, *Crops, *Environmental exposure pathway, *Fallout, *Food chains, *Grass, Man, *Meat, *Milk, *Radioisotopes, *Radionuclide migration, *Soils, *Terrestrial ecosystems, Cattle, Contamination, Deposition, Fission product release, Foliar uptake, Ingestion, Mathematical models, Nuclear facilities, PDP computers, Plants, Radiation accidents, Radioecological concentration, Root absorption, T codes.
Identifiers: ERDA/510302, ERDA/560172, ERDA/053000, Canada, Humans, *TERMOD 2 computer program, Fortran 4 programming language, PDP-10 computers, TERMOD model.

For abstract, see ERA citation 04:043774.

CONF-790229-3 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Carcinogenesis in Mice after Low Doses and Dose Rates.
R. L. Ullrich. 1979, 37p
Contract W-7405-ENG-26
32. annual symposium on fundamental cancer research, Houston, TX, USA, 27 Feb 1979.

Descriptors: *Carcinogenesis, *LET, *Low dose irradiation, Dose rates, Dose-response relationships, Meetings, Mice, Neoplasms, Radioinduction, Radiosensitivity effects.
Identifiers: ERDA/560152, Tissues.

For abstract, see ERA citation 04:041739.

DPSPU-78-302 PC **A08**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Plant.
Environmental Monitoring at the Savannah River Plant. Annual Report, 1977.
C. Ashley, and C. C. Zeigler. Dec 78, 155p
Contract EY-76-C-09-0001

Descriptors: *Air, *Animals, *Drinking water, *Food, *Ground water, *Milk, *Pesticides, *Savannah River, *Savannah River plant, *Soils, Data analysis, Environment, Experimental data, Graphs, Monitoring, Quality control, Radiation monitoring, Tables.
Identifiers: ERDA/500300, ERDA/510300, ERDA/520300, ERDA/500200, ERDA/510200, Potable water.

For abstract, see ERA citation 04:041636.

HEDL-SA-1502FP PC **A03**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Practical Radiation Protection for Radiography.
S. K. Hubbard, and E. A. Proudfoot. 20 Mar 78, 30p CONF-780899-1
Contract EY-76-C-14-2170
Conference on radiation safety in NDT, San Francisco, CA, USA, 1 Aug 1978.

Descriptors: *Industrial radiography, *Nuclear engineering, Personnel, Safety, Education, Hanford reservation, Radiation doses, Radiation hazards, Radiation protection, Working conditions.
Identifiers: ERDA/560151, *Health physics.

For abstract, see ERA citation 04:043824.

LBL-9084 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Effects on Populations of Exposure to Low Levels of Ionizing Radiation: Implications for Nuclear Energy and Medical Radiation. The 1979 Report of the Advisory Committee on the Biological Effects of Ionizing Radiation (The BEIR Report).
J. I. Fabrikant. Apr 79, 46p CONF-790474-1
Contract W-7405-ENG-48
Symposium on known effects of low level radiation exposures, Pittsburgh, PA, USA, 25 Apr 1979.

Descriptors: *Biological radiation effects, Human populations, *Low dose irradiation, Cost benefit analysis, Decision making, Epidemiology, Health hazards, Neoplasms, Nuclear energy, Nuclear medicine, Radioinduction.

Identifiers: ERDA/560151, *Radiation effects, *Health physics.

For abstract, see ERA citation 04:043826.

NUREG/CR-0789 PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Internal Dosimetry Data and Methods of ICRP. Part 1.
M. R. Ford, S. R. Bernard, L. T. Dillman, and S. B. Watson. 15 Sep 78, 68p ORNL/NUREG/TM-315
Contract W-7405-ENG-26

Descriptors: *Dosimetry, *Gastrointestinal tract, *ICRP, *Lungs, *Organs, *Radioactive clouds, *Radioisotopes, Compartments, Computer calculations, Decay, Differential equations, Dose commitments, Dose equivalents, Ingestion, Inhalation, Internal irradiation, Man, Mathematical models, Metabolism, Radiation protection, Radionuclide kinetics, Recommendations, Reference man, Retention, Tissue distribution.
Identifiers: ERDA/560171, ERDA/560161, ERDA/655003.

For abstract, see ERA citation 04:045451.

ORNL-5532 PC **A12**/MF **A01**
Oak Ridge National Lab., TN.
AIRDOS-EPA: A Computerized Methodology for Estimating Environmental Concentrations and Dose to Man from Airborne Releases of Radionuclides.
R. E. Moore, C. F. Baes, III, L. M. McDowell-Boyer, A. P. Watson, and F. O. Hoffman. Jun 79, 270p
Contract W-7405-ENG-26

Descriptors: *Air pollution, Human populations, *Radioactive aerosols, *Radioecological concentration, *Radioisotopes, Computer codes, Deposition, Environmental transport, Equations, Experimental data, Gaseous wastes, Gauss function, Ingestion, Inhalation, Mathematical models, Radiation doses, Stacks, Tables, Us nrc.
Identifiers: ERDA/500300, ERDA/560161, *Health physics.

For abstract, see ERA citation 04:043764.

PB-298 241/1GA PC **A02**/MF **A01**
Environmental Monitoring and Support Lab., Las Vegas, NV. Monitoring Systems Research and Development Div.
Plutonium-239 and Americium-241 Uptake by Plants from Soil.
Final rept.,
Kenneth W. Brown. Mar 79, 25p EPA/600/3-79/026

Descriptors: *Plant growth, *Plutonium 239, *Soils, *Plutonium 238, *Americium isotopes, Radioactive isotopes, Concentration(Composition), Exposure, Time, Metabolism, Plants(Botany).
Identifiers: Uptake, *Bioaccumulation.

Alfalfa was grown in soil contaminated with plutonium-239 dioxide (239PuO2) at a concentration of 29.7 nanocuries per gram (nCi/g). In addition to alfalfa, radishes, wheat, rye, and tomatoes were grown in soils contaminated with americium-241 nitrate (241Am(NO3)3) at a concentration of 189 nCi/g. The length of exposure varied from 52 days for the radishes to 237 days for the alfalfa. The magnitude of plutonium incorporation by the alfalfa as indicated by the concentration ratio, 0.0000025, was similar to previously reported data using other chemical forms of plutonium. The results did indicate, however, that differences in the biological availability of plutonium isotopes do exist. All of the species exposed to americium-241 assimilated and translocated this radioisotope to the stem, leaf, and fruiting structures. The magnitude of incorporation as signified by the concentration ratios varied from 0.00001 for the wheat grass to 0.0152 for the radishes. An increase in the uptake of americium also occurred as a function of time for four of the five plant species. Evidence indicates that the predominant factor in plutonium and americium uptake by plants may involve the chelation of these elements in soils by the action of compounds such as citric acid and/or other similar chelating agents released from plant roots.

PB-298 548/9GA PC **A02**/MF **A01**
Environmental Monitoring and Support Lab., Las Vegas, NV.
Plutonium Uptake by Plants from Soil Containing Plutonium-238 Dioxide Particles.
Journal article,
K. W. Brown, and J. C. McFarlane. 20 Jan 78, 8p EPA/600/J-78/115
Pub. in Health Physics, v35, p481-485, Sep 78.

Descriptors: *Plant growth, *Plutonium 238, *Soils, Plants(Botany), Radioactive isotopes, Exposure, Transuranium elements, Radioactive isotopes.
Identifiers: Reprints, Uptake, *Bioaccumulation.

Three plant species--alfalfa, lettuce, and radishes--were grown in soils contaminated with plutonium-238 dioxide (238PuO2) at concentrations of 23, 69, 92, and 342 nanocuries per gram (nCi/g). The length of exposure varied from 60 days for the lettuce and radishes to 358 days for the alfalfa. The magnitude of plutonium incorporation as indicated by the discrimination ratios for these species, after being exposed to the relatively insoluble PuO2, was similar to previously reported data using different chemical forms of plutonium. Evidence indicates that the predominant factor in plutonium uptake by plants may involve the chelation of plutonium contained in the soils by the action of compounds such as citric acid and/or other similar chelating agents released from the plant roots.

PNL-2462 PC **A03**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
American Coot (Fulica Americana) on the Hanford Site. Part 1. Nesting Biology.
R. E. Fitzner, and R. G. Schreckhise. May 79, 40p
Contract EY-76-C-06-1830

Descriptors: *Behavior, *Birds, *Diet, *Habitat, *Low-level radioactive wastes, *Ponds, *Radioactive waste storage, *Reproduction, Biological radiation effects, Comparative evaluations, Contamination, Ecology, Experimental data, Hanford reservation, Isolated values, Nature reserves, Radiation hazards, Radioactivity.
Identifiers: ERDA/560152, ERDA/520302, ERDA/052002, ERDA/053000, *Fulica americana.

For abstract, see ERA citation 04:043832.

PNL-2932 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Environmental Surveillance at Hanford for CY-1978.
J. R. Houston, and P. J. Blumer. Apr 79, 63p
Contract EY-76-C-06-1830

Descriptors: *Air pollution, *Food, Human populations, *Radiation monitoring, *Radioisotopes, Cobalt 60, Columbia river, Contamination, Dosimetry, Experimental data, Fallout, Hanford reservation, Iodine 131, Isolated values, Milk, Nuclear explosions, Radiation doses, Radioecological concentration, Soils, Standards, Thyroid.
Identifiers: ERDA/560161, ERDA/500300, ERDA/520300, Surveillance, Concentration(Composition), *Environmental surveys.

For abstract, see ERA citation 04:043838.

UCRL-81774 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
New Radiobiological Findings Bearing on the 1977 ICRP Recommendations.
R. L. Dobson. 14 Feb 79, 17p CONF-790316-1
Contract W-7405-ENG-48
Topical seminar on the practical implications of the ICRP recommendation and the revised IAEA basic standards for radiation protection, Vienna, Austria, 5 Mar 1979.

Descriptors: *Beta particles, *Chronic irradiation, *Low dose irradiation, *Oocytes, *Prenatal irradiation, *Radiation protection, *Radiosensitivity, Cobalt 60, Comparative evaluations, Delayed radiation effects, Dose rates, Dose-response relationships, Experimental data, External irradiation, Females, Fetuses, Gamma radiation, Icrp, Ingestion, Internal irradiation, Isolated values, Mice, Monkeys, Pregnancy, Quality factor, Rbe, Recommendations, Risk assessment, Tritium oxides.
Identifiers: ERDA/560152, ERDA/560151.

For abstract, see ERA citation 04:041752.

UR-3490-1570 PC **A03**/MF **A01**
Rochester Univ., NY.
Decreased Uv Mutagenesis in CDC8, a DNA Replication Mutant of Saccharomyces Cerevisiae.
L. Prakash, D. Hinkle, and S. Prakash. 1978, 40p
Contract EY-76-C-02-3490

Descriptors: *Mutants, *Revertants, *Saccharomyces cerevisiae, *Ultraviolet radiation, Biological repair, DNA replication, Experimental data, Genetic radiation effects, Graphs, Irradiation, Mutagenesis, Radioinduction, Radiosensitivity.
Identifiers: ERDA/560131, ERDA/550400, ERDA/550700, Deoxyribonucleic acids, Bacteria.

For abstract, see ERA citation 04:041731.

UR-3490-1607 PC **A09**/MF **A01**
Rochester Univ., NY. Dept. of Radiation Biology and Biophysics.
Study on the Induction of Thyroid Tumors in Rats Using X Irradiation in Conjunction with a Goitrogen.
P. Mahler. 1979, 196p
Contract EY-76-C-02-3490
Thesis.

Descriptors: *Antithyroid drugs, *Carcinogenesis, *Neoplasms, *Thyroid, *X radiation, Acute irradiation, Biological effects, Biological radiation effects, Dose-response relationships, Experimental data, Graphs, Histology, Imidazoles, Local irradiation, Radioinduction, Radiosensitivity effects, Rats, Tables, Thiols, Thyroxine.
Identifiers: ERDA/560152, ERDA/560305, ERDA/551000, ERDA/550900, Laboratory animals, *Radiation effects.

For abstract, see ERA citation 04:041753.

6S. Stress Physiology

AD-A070 637/4GA PC **A99**/MF **A01**
Pennsylvania Univ Philadelphia Inst for Environmental Medicine
Work Capability and Physiological Effects in He-O2 Excursions to Pressures or 400-800-1200 and 1600 Feet of Sea Water. Predictive Studies IV,
C. J. Lambertsen, R. Gelfand, and J. M. Clark. 1978, 689p Rept no. IEM-78-1
Contracts N00014-67-A-0216-0026, N00014-67-A-0216-0037
Sponsored in part by Contract N00014-75-C-1124 and Grants PHS-HL-0889 and NSG-9011.

Descriptors: *Pressure breathing, *Physiological effects, Exposure(Physiology), Helium, Oxygen, Sea testing, High pressure, Predictions, Compression, Decompression, Saturation diving.
Identifiers: Performance(Physiology), *Stress(Physiology).

For the fourth in the series of 'Predictive Studies', experiments at the Institute for Environmental Medicine during the summer of 1975 exposed men in chambers, breathing helium with oxygen, to progressive increases of pressure equivalent to 400-800-1200-1600 feet of sea water (fsw). Rates of compression were selected to purposely induce physiological derangements associated with both initial exposure to compression and exposure to stable high pressure. Goals included: (a) determination of the specific character and time course of onset of physiological and performance decrements during the intentionally rapid compressions, and determination of rates of adaptation on reaching stable elevated pressure; (b) investigation of accelerated methods for decompression in deep saturation-excursion diving; and (c) determination of competence in practical work performed in water at pressures equivalent to the extreme diving depths of 1200 and 1600 fsw. Predictive Studies IV has indicated the time course of onset and adaptation to effects of rapid compression and has shown the existence of a capacity for more efficient decompression in excursions during deep saturation than in shallow excursions from sea level. It has demonstrated the ability of men to perform useful scientific, physical and technical work at the high pressures of deep undersea exposures.

6T. Toxicology

AD-A070 543/4GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD

Immunogenicity of Formaldehyde-Inactivated Enterotoxins A and C1 of 'Staphylococcus aureus',
John R. Warren, Leonard Spero, Joseph F. Metzger, and Virginia G. McGann. 26 Aug 74, 8p
Availability: Pub. in The Jnl. of Infectious Diseases, v131 n5 p535-542 May 75. (No copies furnished by DDC).

Descriptors: *Enterotoxins, *Staphylococcus aureus, Formaldehyde, Vaccines, Purification, Reprints.
Identifiers: *Bacteria.

No abstract available.

AD-A070 550/9GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Possible Endotoxemia in Rabbits after Intravenous Injection of 'Staphylococcus aureus' Enterotoxin B,
George W. Pettit, Michael R. Elwell, and Peter B. Jahrling. 23 Jan 76, 3p
Availability: Pub. in the Jnl. of Infectious Diseases, v135 n4 p646-648 Apr 77 (No copies furnished by DDC).

Descriptors: *Endotoxins, *Enterotoxins, Food poisoning, Toxicity, Staphylococcus aureus, Rabbits, Reprints.
Identifiers: *Bacteria.

No abstract available.

AD-A070 654/9GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Choleragen (Cholera Toxin): A Bacteria Lectin,
Roberta L. Richards, Joel Moss, Carl R. Alving, Peter H. Fishman, and Roscoe O. Brady. 1979, 5p
Pub. in Proceedings of the National Academy of Sciences of the United States of Ameria, v76 n4 p1673-1676 Apr 79.

Descriptors: *Bacterial toxins, Proteins, *Cholera, Erythrocytes, Agglutination, Reprints.
Identifiers: *Choleragen.

No abstract available.

AD-A070 656/4GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Methaqualone Metabolites and Their Significance in Acute Intoxication,
Leo Kazyak, Robert M. Anthony, and Irving Sunshine. 1 Dec 78, 6p
Pub. in Jnl. of Analytical Toxicology, v3 p67-71 Mar/Apr 79.

Descriptors: *Methaqualone, Intoxication, *Metabolites, Blood analysis, Toxicity, Urine, Gas chromatography, Reprints.
Identifiers: *Toxicology.

No abstract available.

AD-A070 659/8GA Not available NTIS
Army Medical Research Inst of Infectious Diseases Frederick MD
Hypertriglyceridemia Produced by Endotoxin: Role of Impaired Triglyceride Disposal Mechanisms,
Robert L. Kaufmann, Charles F. Matson, and William R. Beisel. 19 Sep 75, 8p
Availability: Pub. in Jnl. of Infectious Diseases, v133 n5 p548-555 May 76. (No copies furnished by DDC).

Descriptors: *Salmonella typhimurium, *Endotoxins, Serum triglycerides, Lipids, Rhesus monkeys, Fatty acids, Reprints.
Identifiers: *Hypertriglyceridmia, *Bacteria.

No abstract available.

AD-A070 914/7GA PC **A02**/MF **A01**
Brigham Young Univ Provo UT Dept of Microbiology
Effect of Chemical Mutagens on Herpes Virus Transformation and Backmutation of THO Cells.
Final rept. 1 May 78-30 Apr 79,
F. Brent Johnson. Jun 79, 25p AFOSR-TR-79-0829
Grant AFOSR-78-3606

Descriptors: *Herpes simplex virus, *Mutagens, Carcinogens, Hydrazine, Methyl hydrazines, Irradiation, Ultraviolet radiation, Sulfonates, Jet engine fuels.
Identifiers: Mice, Laboratory animals.

Quantitative transformation assays detecting morphological transformation of Swiss mouse 3T3 cells by herpes simplex virus type 2 were employed to detect transformation enhancement by potentially mutagenic and carcinogenic chemicals. Hydrazine and 1,2-dimethylhydrazine enhanced the number of transformed foci from two to two and one-half fold in cultures that were exposed to both UV-irradiated virus and chemicals as compared to cultures which were exposed only to the irradiated virus. Other chemicals tested, that did not enhance transformation, were ethylmethanesulfonate, 3-methycholanthrene, 1,1-dimethylhydrazine monomethylhydrazine, JP-5, JP-10, RJ-4, and RJ-5. Mutagenesis tests in THO cells, employing the nonactivated compounds, detected slight mutagenic activity of ethylmethanesulfonate but failed to detect mutagenic activity with any of the other other test compounds. (Author)

BNL-25707 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Critical Concentrations of Cadmium in Human Liver and Kidney Measured by Prompt-gamma Neutron Activation.
S. H. Cohn, D. Vartsky, S. Yasumura, I. Zanzi, and K. J. Ellis. 1979, 16p CONF-790225-1
Contract EY-76-C-02-0016
International cadmium conference, Cannes, France, 6 Feb 1979.

Descriptors: *Cadmium, *Kidneys, *Liver, Activation analysis, Age dependence, Beryllium 9, Biological accumulation, Biological half-life, Cadmium 113, Capture, Diet, Experimental data, Isolated values, Li-drifted ge detectors, Man, Neutron reactions, Neutron sources, Plutonium 235, Prompt gamma radiation, Sex dependence, Tobacco smokes, Weight.
Identifiers: ERDA/560306, ERDA/400101, Concentration(Composition), Bioaccumulation, Humans, Metabolism, *Toxic substances

For abstract, see ERA citation 04:041765.

BNL-50889 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Some Potential Effects of Acid Rain on Forest Ecosystems: Implications of a Computer Simulation.
D. B. Botkin, and J. D. Aber. Apr 79, 16p
Contract EY-76-C-02-0016

Descriptors: *Acid rain, *Forests, *Trees, Air pollution, Biological effects, Biomass, Computer codes, Foliar uptake, Graphs, J codes, Leaves, Mathematical models, Population dynamics, Productivity, Simulation, Species diversity, Terrestrial ecosystems, Theoretical data.
Identifiers: ERDA/560303, ERDA/500200, ERDA/553000, *Air pollution effects(Plants).

For abstract, see ERA citation 04:045456.

CONF-790227-2 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Induction of Mutagenesis and Alterations in Gene Expression by Tumorigenic Chemicals.
E. Huberman. 1979, 16p
Contract W-7405-ENG-26
International workshop on short-term tests for prescreening of potential carcinogens, Genoa, Italy, 6 Feb 1979.

Descriptors: *Animal cells, *Carcinogenesis, *Carcinogens, *Mutagenesis, *Polycyclic aromatic hydrocarbons, Biological effects, Cell cultures, Chickens, Esters, Hamsters, Liver, Man, Mice, Ouabain.
Identifiers: ERDA/560301, ERDA/550200.

For abstract, see ERA citation 04:041759.

COO-3474-4 PC **A02**/MF **A01**
State Univ. of New York Coll. of Environmental Science and Forestry Syracuse.
Cycling and Effects of exp 36 Cl Labeled DDT on Soil Invertebrates.
D. L. Dindal. Aug 78, 24p
Contract EY-76-S-02-3474

Descriptors: *Arthropods, *Chlorine 36, *DDT, *Microorganisms, *Soils, Biological effects, Colony formation, Environmental transport, Experimental data, Graphs, Mites, *Pesticides, Pollution, Population dynamics, Respiration, Snails, Species diversity, Spectrometers.
Identifiers: ERDA/560304, ERDA/510200, *Toxicology, *Toxic substances.

For abstract, see ERA citation 04:043845.

COO-4368-1 PC **A03**/MF **A01**
Boyce Thompson Inst. for Plant Research, Inc., Yonkers, NY.
Effects of Sulfur Dioxide and Nitrogen Dioxide on Vegetation. Progress Report, 1 June 1977–28 February 1978.
L. H. Weinstein, D. C. McCune, and D. C. MacLean. Feb 78, 30p
Contract EE-77-S-02-4368

Descriptors: *Nitrogen oxides, *Sulfur oxides, Beetles, Biological effects, Combustion, Conifers, Crops, Experimental data, Fossil fuels, Isolated values, Metabolism, Plant diseases, Productivity, Soybeans.
Identifiers: ERDA/560303, ERDA/500200, *Plants(Botany), *Air pollution effects(Plants), Phytotoxicity.

For abstract, see ERA citation 04:041760.

IS-T-842 PC **A05**/MF **A01**
Ames Lab., IA.
Preliminary Studies of the Biosynthesis of Austin.
N. A. Wicnienski. Jan 79, 89p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Aspergillus, *Toxins, Alkaloids, *Biosynthesis, Carbon 13, Metabolites, Molecular structure, Toxicity, Tracer techniques.
Identifiers: ERDA/550201, *Fungi.

For abstract, see ERA citation 04:041714.

PB-298 511/7GA PC **A06**/MF **A01**
National Cancer Inst., Bethesda, MD. Carcinogenesis Testing Program.
Bioassay of Aldicarb for Possible Carcinogenicity.
Technical rept.
1979, 104p* NCI-CG-TR-136, DHEW/PUB/NIH-79-1391

Descriptors: *Toxicology, Ingestion(Biology), Rats, Mice, Laboratory animals, Experimental data, Males, Females, Diets, Dosage, Dose rate, Bioassay, Pathology, Histology, Sulfur organic compounds, Carbamates.
Identifiers: *Carcinogenesis, CAS 116-06-3, *Propionaldehyde/methyl-(methylthio)-O-(methylcarbamoyl)-oxime, Temik.

A bioassay of aldicarb for possible carcinogenicity was conducted by administering the test chemical in feed to F344 rats and B6C3F1 mice. Groups of 50 rats and 50 mice of each sex were administered aldicarb at one of two doses, either 2 or 6 ppm, for 103 weeks. Matched controls consisted of 25 untreated rats and 25 untreated mice of each sex. No tumors occurred in either the rats or mice at incidences that could clearly be related to administration of the test chemical. It is concluded that under the conditions of this bioassay, technical-grade aldicarb was not carcinogenic for F344 rats or B6C3F1 mice of either sex.

PB-298 512/5GA PC **A05**/MF **A01**
National Cancer Inst., Bethesda, MD. Carcinogenesis Testing Program.
Bioassay of Lead Dimethyldithiocarbamate for Possible Carcinogenicity.
Technical rept.
1979, 99p* NCI-CG-TR-151, DHEW/PUB/NIH-79-1707

Descriptors: *Toxicology, Rats, Mice, Laboratory animals, Experimental data, Bioassay, Dose rate, Males, Females, Histology, Pathology, Lethal dosage, Ingestion(Biology), Diets, Sulfur organic compounds.
Identifiers: *Lead/bis(dimethyldithiocarbamato), *Carcinogenesis, Cancer, CAS 19010-66-3.

A bioassay of technical-grade lead dimethyldithiocarbamate for possible carcinogenicity was conducted by administering the test chemical in feed to F344 (Fischer) rats and mice. Groups of 50 rats of each sex and 50 mice of each sex were administered lead dimethyldithiocarbamate at one of two doses, either 25 or 50 ppm, for 104 or 205 weeks. Matched controls consisted of 20 untreated rats and 20 untreated mice of each sex. No tumors occurred in the rats or mice of either sex at incidences that were significantly higher in the dosed groups than in the control groups. It is concluded that under the condition of this bioassay, lead dimethyldithiocarbamate was not carcinogenic for F344 rats or B6C3F1 mice of either sex.

PB-298 513/3GA PC **A06**/MF **A01**
National Cancer Inst., Bethesda, MD. Carcinogenesis Testing Program.
Bioassay of Ethyl Tellurac for Possible Carcinogenicity.
Technical rept.
1979, 114p* NCI-CG-TR-152, DHEW/PUB/NIH-79-1708

Descriptors: *Toxicology, Diets, Bioassay, Ingestion(Biology), Rats, Mice, Laboratory animals, Experimental data, Males, Females, Dose rate, Adenomas, Eye(Anatomy), Sulfur organic compounds.
Identifiers: Lacrimal apparatus diseases, *Carcinogenesis, Medical research, Cancer, Mesothelioma, Harderian gland, CAS 20941-65-5, CAS 30145-38-1, *Tellurium/tetrakis(diethyldithiocarbamato).

A bioassay of technical-grade ethyl tellurac for possible carcinogenicity was conducted by administering the preparation in feed to F344 rats and B6C3F1 mice. Groups of 50 rats of each sex were administered ethyl tellurac at one of two doses, either 300 or 600 ppm for the males and either 150 or 300 ppm for the females, for 105 weeks. Matched controls consisted of 20 untreated rats of each sex. Groups of 50 mice of each sex were administered ethyl tellurac at one of two doses for 104 weeks. The time-weighted average doses for the males were either 1,255 or 3,132 ppm; for the females either 2,123 or 4,915 ppm. Matched controls consisted of 20 untreated mice of each sex. In the male rats, mesotheliomas occurred at incidences that were dose related. In the female rats, no tumors occurred at incidences that were clearly related to administration of the test chemical. In both male and female mice, adenomas of the lacrimal (harderian) gland of the eye occurred in the dosed groups. It is concluded that under the conditions of this bioassay, technical-grade ethyl tellurac was not carcinogenic for female F344 rats; in male rats the incidence of mesotheliomas was suggestive of carcinogenicity. In male and female B6C3F1 mice, the test chemical was carcinogenic, inducing adenomas of the lacrimal (harderian) gland of the eye.

PB-298 514/1GA PC **A05**/MF **A01**
National Cancer Inst., Bethesda, MD. Carcinogenesis Testing Program.
Bioassay of Tetraethylthiuram Disulfide for Possible Carcinogenicity.
Technical rept.
1979, 97p* NCI-CG-TR-166, DHEW/PUB/NIH-79-1722

Descriptors: *Toxicology, Diets, Ingestion(Biology), Rats, Mice, Males, Females, Bioassay, Dosage, Laboratory animals, Experimental data, Mortality, Histology, Pathology, Dose rate, Sulfur organic compounds.
Identifiers: *Carcinogenesis, CAS 97-77-8, Cancer, *Disulfide/bis(diethylthiocarbamoyl).

A bioassay of tetraethylthiuram disulfide (disulfiram) for possible carcinogenicity was conducted by administering the test chemical in feed to F344 rats and B6C3F1 mice. Groups of 50 rats of each sex were administered tetraethylthiuram disulfide in the diet at one of two doses, either 300 or 600 ppm, for 107 weeks. Groups of 50 mice of each sex were administered the test chemical at one of two doses, either 500 or 2,000 ppm for the males and either 100 or 500 ppm for the females, for 108 weeks. Matched controls consisted of 20 untreated rats and 20 untreated mice of each sex. No tumors occurred in the rats or mice of either sex at incidences that were significantly higher in dosed groups than in corresponding control groups. It is concluded that under the conditions of this bioassay, tetraethylthiuram disulfide was not carcinogenic for F344 rats or B6C3F1 mice of either sex.

PB-298 531/5GA Not available NTIS
Monsanto Research Corp., Dayton, OH.
Textile Plant Wastewater Toxicity.
Journal article,
Gary D. Rawlings, and Max Samfield. c1979, 5p
EPA/600/J-79/016
Pub. in Environ. Sci. and Tech., v13 n2 p160-164, Feb 79.

Descriptors: *Textile industry, *Toxicology, *Waste water, Bioassay, Waste disposal, Concentration(Composition), Data collection, Water pollution.
Identifiers: Baseline data, *Water pollution control.

The paper gives results of a study to provide chemical and toxicological baseline data on wastewater samples collected from 32 textile plants in the U.S. Raw waste and secondary effluent wastewater samples were analyzed for 129 consent decree priority pollutants, effluent guidelines criteria pollutants, and nutrients; Level 1 chemical analyses were also performed. Secondary effluent samples from 23 plants investigated in the EPA/ATMI BATEA Study (American Textile Manufacturers Institute/ best available technology economically achievable-EPA grant no. R804329) were submitted for seven bioassays: mutagenicity, cytotoxicity, clonal assay, freshwater ecology series (Fathead minnows, Daphnia, and algae), marine ecology series (sheepshead minnows, grass shrimp, and algae), 14-day rat acute toxicity, and soil microcosm. Test results showed that 10 of the 23 textile plants had secondary effluents sufficiently toxic to proceed to a second phase study. In the second phase, samples will be collected from the 10 plants to determine the amount of toxicity removed by selected tertiary treatment technologies.

PB-298 813/7GA PC **A04**/MF **A01**
Battelle Columbus Toxicology Program Office, Vienna, VA.
Acute Cardiovascular Effects of 3-Deazauridine (NSC-126849) Following Continuous Intravenous Infusion to Anesthetized Beaglehounds.
Final rept. 18 Jan-20 Feb 79,
R. L. Hamlin, F. S. Pipers, P. Mihalko, T. J. Miller, and M. S. Frick. 15 Jul 79, 53p
Contract N01-CM-4-3746
Prepared by Ohio State Univ., Columbus. Dept. of Veterinary Physiology and Pharmacology. Rept. no. OSU-RHFP-126849-28.

Descriptors: *Furans, *Toxicology, *Antineoplastic agents, Dogs, Nitrogen organic compounds, Toxicity, Dosage, Dose rate, Parenteral infusions, Bioassay, Laboratory animals, Experimental data, Pathology, Lethal dosage, Electrocardiography, Cardiovascular system.
Identifiers: NSC 126849, *Pyridinedione/ribofuranosyl.

Healthy, anesthetized beaglehounds were instrumented to monitor various cardiovascular parameters and their responses to doses of 1000, 2000, or 3000 mg/kg (20000, 40000 or 60000 mg/sq. m.). Compound was given intravenously over an interval varying between approximately 20 and 60 minutes, and recordings were obtained during 2 control periods and at 5, 20, 40 and 60 minutes after termination of infusion. All dogs survived the 60 minute surveillance and no dog manifested serious derangement of parameters monitored. A single dog receiving the highest dose developed a rather precipitous fall in cardiac output by the 60th minute after infusion; otherwise only slight and clinically insignificant alterations in pressures and vascular resistance were observed. QRS duration and QT interval of the electrocardiogram prolonged in dogs receiving the highest and intermediate doses of this compound. This negative dromotropism mimics the effects of quinidine, and should be investigated further if this agent has potential for its antineoplastic qualities.

PNL-2931 PC **A03**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Biocide by-Products in Aquatic Environments. Quarterly Progress Report, October 1--December 31, 1978.
D. R. Anderson, R. M. Bean, and C. I. Gibson.
Mar 79, 45p
Contract EY-76-C-06-1830

Descriptors: *Antifoulants, *Chloroform, *Condenser cooling systems, *Fishes, *Molluscs, Aquatic ecosystems, Chemical effluents, Chlorination, Chronic exposure, Environmental effects, Experimental data, Isolated values, Mortality, Pathological changes, Thermal power plants, Toxicity, Water pollution.
Identifiers: ERDA/560304, ERDA/560305, ERDA/520200, ERDA/200200, ERDA/220503, *Biocides, Bioassay, Salmo gairdneri, Lepomis macrochirus, Ictalurus punctatus, Lethal dosage, Histology, *Water pollution effects(Animals).

For abstract, see ERA citation 04:041762.

UCLA-12-1182 PC **A03**/MF **A01**
Colorado Univ. Medical Center, Denver.
Cellular and Molecular Toxicology of Lead IV. Effect of Lead on Iron Uptake.
L. Lake, and L. E. Gerschenson. 1979, 33p
Contract W-7405-ENG-48

Descriptors: *Calcium 45, *Heme, *Iron 59, *Lead, Animal cells, Binding energy, Biological effects, Biosynthesis, Experimental data, Isolated values, Rats, Temperature dependence, Toxicity, Transferrin, Uptake.
Identifiers: ERDA/560301, *Toxicology, *Toxic substances, Laboratory animals, Experimental data, Cell cultures.

For abstract, see ERA citation 04:037573.

7. CHEMISTRY

7A. Chemical Engineering

AED-CONF-77-97-010 PC **A02**/MF **A01**
Farbwerke Hoechst A.G., Frankfurt am Main (Germany, F.R.).
Application of the Safety Measure 'Explosion Pressure Release' in Vessels and Apparatus in the Chemical Industry.
C. Donat. 1977, 18p CONF-7706113-4
In German.DECHEMA annual meeting, Frankfurt am Main, F.R. Germany, 23 Jun 1977, Portions of document are illegible.
U.S. Sales Only.

Descriptors: *Chemical industry, *Pressure vessels, Explosions, Graphs, High pressure, Mathematical models, Pressure release, Relief valves, *Safety engineering, Theoretical data.
Identifiers: ERDA/420600, West Germany.

For abstract, see ERA citation 04:027543.

CONF-780891-1 PC **A02**/MF **A01**
Institute of Gas Technology, Chicago, IL.
SNG From Peat by the PEATGAS Process.
D. V. Punwani, J. L. Arora, and C. L. Tsaros.
1978, 19p
Contract EX-76-C-01-2469
Annual international conference on coal gasification, liquefaction, and conversion to electricity, Pittsburgh, PA, USA, 1 Aug 1978.

Descriptors: *High btu gas, *Peatgas process, Ammonia, Benzene, By-products, Flowsheets, Fuel oils, Gasification, Peat, Sng plants, Sulfur, Synthesis, Thermal efficiency.
Identifiers: ERDA/090121, ERDA/010404.

For abstract, see ERA citation 04:025756.

COO-4589-1 PC **A06**/MF **A01**
Marquette Univ., Milwaukee, WI.
Thermodynamic-Economic Analysis of the Synthane Process.
R. Gaggioli, L. Rodriguez, and W. Wepfer. Nov 78, 104p
Contract EY-77-S-02-4589

Descriptors: *Synthane process, Coal gasification, Cost, Economic analysis, Efficiency, Fuel gas, Thermodynamics.
Identifiers: ERDA/010404, ERDA/015000, ERDA/294001.

For abstract, see ERA citation 04:042158.

FE-1548-17 PC **A03**/MF **A01**
Eyring Research Inst., Provo, UT.
Experimental and Process Design Study of a High Rate Gasification Process. Quarterly Technical Report No. 17, April--June 1978.
M. J. McIntosh. 1978, 31p
Contract EX-76-C-01-1548

Descriptors: *Coal gasification, *Coal gasification plants, Correlations, Data, Design, Entrainment, Fuel feeding systems, Mathematical models, Medium pressure, Operation, Pilot plants.
Identifiers: ERDA/010404.

For abstract, see ERA citation 04:042159.

FE-1743-62 PC **A04**/MF **A01**
Conoco Coal Development Co., Library, PA. Research Div.
Zinc Halide Hydrocracking Process for Distillate Fuels from Coal.
C. R. Greene, C. W. Zielke, M. Pell, G. H. Bagshaw, and R. T. Struck. 20 Nov 78, 67p
Contract EX-76-C-01-1743

Descriptors: *Gasoline, *Solvent-refined coal, *Zinc chlorides, *Zinc halide process, Catalysts, *Coal liquefaction, Comparative evaluations, Corrosive effects, Economics, Hydrocracking, Hydrogenation, Process development units, Recovery, Regeneration, Yields, Zinc.
Identifiers: ERDA/010405, ERDA/010600.

For abstract, see ERA citation 04:044224.

FE-1775-19 PC **A03**/MF **A01**
Parsons (Ralph M.) Co., Pasadena, CA.
Prestressed Concrete Pressure Vessels: Conceptual Design/Economic Analysis. Executive Summary. R And D Report No. 114, Interim Report No. 8.
Sep 78, 44p
Contract EX-76-C-01-1775

Descriptors: *Coal gasification plants, *Coal liquefaction plants, *Pressure vessels, *Prestressed concrete, Economics, Feasibility studies, Materials, Recommendations.
Identifiers: ERDA/010404, ERDA/010405, ERDA/360600.

For abstract, see ERA citation 04:042160.

FE-1793-43 PC **A03**/MF **A01**
Foster-Miller Associates, Inc., Waltham, MA.
Coal Feeder Development. Phases II and III. Progress Report, January 1--June 30, 1978.
Oct 78, 31p
Contract EX-76-C-01-1793

Descriptors: *Coal gasification plants, *Fuel feeding systems, Performance testing, Test facilities.
Identifiers: ERDA/010404, ERDA/013000.

For abstract, see ERA citation 04:044208.

FE-2247-18 PC **A03**/MF **A01**
Texaco, Inc., South El Monte, CA. Montebello Research Lab.
Gasification of Residual Materials from Coal Liquefaction. Annual Report,, July 1977--June 1978.
A. M. Robin. Sep 78, 28p
Contract EX-76-C-01-2247

Descriptors: *Coal liquefaction plants, *Residues, Chars, Clean coke process, Experimental data, Exxon liquefaction process, Gasification, H-coal process, Src process, Src-ii process, Synthoil process, Tables, Texaco gasification process.
Identifiers: ERDA/010404, ERDA/010405.

For abstract, see ERA citation 04:044210.

FE-2270-36 PC **A07**/MF **A01**
Catalytic, Inc., Wilsonville, AL.
Solvent Refined Coal (SRC) Process Operation of Solvent Refined Coal Pilot Plant. Quarterly Technical Progress Report for April--June 1978.
H. E. Lewis, W. H. Weber, G. B. Usnick, W. R. Hollenack, and H. O. Blair. Jan 79, 149p
Contract EX-76-C-01-2270

Descriptors: *Coal liquids, *Src process, Centrifugation, Coal liquefaction, Deashing, Experimental data, Filtration, Flowsheets, Graphs, Operation, Pilot plants, Tables.
Identifiers: ERDA/010405, ERDA/010402.

For abstract, see ERA citation 04:044225.

FE-2276-24 PC **A03**/MF **A01**
Mobil Research and Development Corp., Paulsboro, NJ.
Development Studies on Selected Conversion of Synthesis Gas from Coal to High Octane Gasoline. Quarterly Report, April--June 1978.
J. A. Brennan. Jul 78, 36p
Contract EX-76-C-01-2276

Descriptors: *Catalysts, *Mobil m-gasoline process, Bench-scale experiments, Coal gasification, Gasoline, Regeneration, Specificity, Synthesis gas.
Identifiers: ERDA/010404, ERDA/010405, ERDA/090221, ERDA/090121.

For abstract, see ERA citation 04:044211.

FE-2315-25 PC **A11**/MF **A01**
Chevron Research Co., Richmond, CA.
Refining and Upgrading of Synfuels from Coal and Oil Shales by Advanced Catalytic Processes. First Interim Report, Processing of Paraho Shale Oil.
R. F. Sullivan, B. E. Stangeland, C. E. Rudy, D. C. Green, and H. A. Frumkin. Apr 78, 228p
Contract EX-76-C-01-2315

Descriptors: *Shale oil, *Catalytic cracking, Coking, Cost, Experimental data, Graphs, Hydrocracking, Hydrogenation, Paraho process, Refining, Tables.
Identifiers: ERDA/040403.

For abstract, see ERA citation 04:044353.

FE-2315-31 PC **A03**/MF **A01**
Chevron Research Co., Richmond, CA.
Refining and Upgrading of Synfuels from Coal and Oil Shales by Advanced Catalytic Processes. Quarterly Report, July--September 1978.
R. F. Sullivan. Oct 78, 48p
Contract EX-76-C-01-2315

Descriptors: *Coal liquids, *Nitrogen, *Oxygen, *Src-ii process, *Sulfur, Coal liquefaction, Cycloalkanes, Denitrification, Experimental data, Hydrogenation, Jet engine fuels, Purification, Refining, Removal, Tables.
Identifiers: ERDA/010405, ERDA/010402.

For abstract, see ERA citation 04:044227.

FE-2416-33 PC **A03**/MF **A01**
Badger Plants, Inc., Cambridge, MA.
Conceptual Designs of Commercial Facilities Coal-to-Methanol Plant and Methanol-to-Gasoline Plant. Annual Report for August 1, 1977--July 28, 1978.
12 Sep 78, 35p
Contract EX-76-C-01-2416
Quarterly report, 1 May 1978--28 July 1978 included.

Descriptors: *Coal liquefaction plants, *Gasoline plants, *Mobil m-gasoline process, Capital, Coal gasification, Design, Engineering, Gasoline, Methanol, Production.
Identifiers: ERDA/010404, ERDA/090121, ERDA/090221.

For abstract, see ERA citation 04:044213.

FE-2547-26 PC **A06**/MF **A01**
Hydrocarbon Research, Inc., Lawrenceville, NJ.
Laboratory Program to Support H-Coal Pilot Plant Operations. PDU Run 6: Syncrude Mode Operating Using Wyodak Coal.
A. G. Comolli, E. S. Johanson, and P. Sheth. Nov 78, 122p
Contract EF-77-C-01-2547

Descriptors: *H-coal process, Coal liquefaction, Experimental data, Process development units, Tables, Yields.
Identifiers: ERDA/010405.

For abstract, see ERA citation 04:044228.

FE-2577-T2 PC **A02**/MF **A01**
Grace (W.R.) and Co., Memphis, TN.
Synthesis Gas Demonstration Plant Program. Quarterly Technical Progress Report, 1 July--30 September 1978.
M. R. Simpson. 1978, 20p
Contract EF-77-C-01-2577

Descriptors: *Coal gasification plants, *Synthesis gas, Coal preparation, Demonstration plants, Design, Engineering, Purification, Rectisol process, Selexol process.
Identifiers: ERDA/010404.

For abstract, see ERA citation 04:042168.

FE-2579-20 PC **A03**/MF **A01**
Combustion Power Co., Inc., Menlo Park, CA.
Granular Bed Filter Development Program. Phase II. Monthly Technical Progress Report, October 1--31, 1978.
K. E. Phillips. 1978, 39p
Contract EF-77-C-01-2579

Descriptors: *Granular bed filters, Mathematical models, Optimization, Performance, Performance testing, Research programs, Test facilities.
Identifiers: ERDA/010800, ERDA/200202, High temperature tests.

For abstract, see ERA citation 04:040169.

MIT-2295T9-9 PC **A13**/MF **A01**
Massachusetts Inst. of Tech., Cambridge.
Computer-Aided Industrial Process Design: The ASPEN Project. Second Annual Report, June 1, 1977--May 30, 1978.
15 Jun 78, 276p
Contract EX-76-C-01-2295-009

Descriptors: *Coal gasification plants, *Coal liquefaction plants, *Computer-aided design, Carbon dioxide acceptor process, Hygas process, Simulation.
Identifiers: ERDA/010404, ERDA/010405, ERDA/990200.

For abstract, see ERA citation 04:042186.

NTIS/PS-79/0876/7GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waste Processing and Pollution in the Chemical and Petrochemical Industries. Volume 3. 1977 (A Bibliography with Abstracts).
Rept. for 1977,
Diane M. Cavagnaro. Sep 79, 176p*
See also Volume 1, 1964-1974, NTIS/PS-76/0608 and Volume 2, 1975-1976, NTIS/PS-78/0825.

Descriptors: *Air pollution control, *Petroleum refining, *Industrial waste treatment, *Chemical industry, *Solid waste disposal, *Water pollution control, *Bibliographies, Water pollution, Air pollution, Industrial wastes, Economic factors, Refineries, Combustion products, Air pollution abatement, Water pollution abatement, Abstracts.
Identifiers: Petrochemical industry.

This bibliography cites reports concerning waste processing and pollution in the chemical and petrochemical industries. Topics discussed include emissions, economics, control processes, pollution effects, and abatement strategies. (This updated bibliography contains 170 abstracts, none of which are new entries to the previous edition.)

NTIS/PS-79/0877/5GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Waste Processing and Pollution in the Chemical and Petrochemical Industries. Volume 4. 1978-August, 1979 (A Bibliography with Abstracts).
Rept. for 1978-Aug 79,
Diane M. Cavagnaro. Sep 78, 197p*
Supersedes NTIS/PS-78/0826, NTIS/PS-77/0706, NTIS/PS-76/0607, NTIS/PS-75/541, and NTIS/PS-74/118. See also Volume 1, 1964-1974, NTIS/PS-76/0608, Volume 2, 1975-1976, NTIS/PS-78/0825, and Volume 3, 1977, NTIS/PS-79/0876.

Descriptors: *Air pollution control, *Petroleum refining, *Industrial waste treatment, *Chemical industry, *Solid waste disposal, *Water pollution

control, *Bibliographies, Water pollution, Air pollution, Industrial wastes, Economic factors, Refineries, Combustion products, Air pollution abatement, Water pollution abatement, Abstracts.
Identifiers: Petrochemical industry.

These citations from Federally funded research cover many aspects of waste processing and pollution in the chemical and petrochemical industries. The bibliography includes emissions, economics, control processes, pollution effects, and abatement strategies. (This updated bibliography contains 170 abstracts, 126 of which are new entries to the previous edition.)

SAN-1254-2 PC **A08**/MF **A01**
Physical Sciences, Inc., Woburn, MA.
Modeling of Coal Gasification for Fuel Cell Utilization. Final Report, May 1, 1976--June 6, 1978.
M. L. Finson, G. Kothandaraman, P. F. Lewis, G. A. Simons, and G. Wilemski. Jun 78, 158p PSI-TR-136
Contract EY-76-C-03-1254

Descriptors: *Coal gasification, *Fuel cells, Entrainment, *Mathematical models, Power generation.
Identifiers: ERDA/010404, ERDA/300501, Forecasting, Combined-cycle power plants, Electric power plants.

For abstract, see ERA citation 04:044217.

7B. Inorganic Chemistry

AD-A071 194/5GA PC **A02**/MF **A01**
Aerospace Corp El Segundo CA Ivan A Getting Labs
The Production of Chloramine by Liquid Phase Injection of Ammonia and Chlorine.
Final rept.,
Charles C. Badcock, and Donna J. Milgaten. 1 Jun 79, 19p TR-0078(3447)-2, SAMSO-TR-79-41
Contract F04701-77-C-0078

Descriptors: *Chlorine compounds, *Amines, *Synthesis(Chemistry), Liquids, Gases, Injectors, Ratios, Liquefied gases, Ammonia, Hydrazine, Hydrazine derivatives, Methyl hydrazines.
Identifiers: *Chloramine.

The results of preliminary experiments on the injection of liquid reactants NH3 and Cl2 into a reactor chloramine NH2Cl are reported. The normal process for the anhydrous production of NH2Cl introduces the reactants as gases. The direct injection of liquid reactants would be a simplification. Problems with the constancy of reactant delivery and dispersion of liquid reactants caused the observed yields to vary greatly. AT NH3/Cl2 ratios of 3.3 all of the NH3 was consumed in two experiments and dichloramine was detected in the analytical solutions. When the ratio was increased to 4.3, NH3 was presented in all cases and one experiment gave a yield of 60 percent NH2Cl. No plugging of the injectors was observed in any of the experiments and continuous operation appeared feasible. The NH4Cl product formed in large flakes that only weakly adhered to the reactor parts. The NH4Cl settled out much more rapidly in the liquid injection experiments than in comparable gas phase injection experiments. The development of this approach should be considered. (Author)

AD-A071 195/2GA PC **A03**/MF **A01**
Aerospace Corp El Segundo CA Ivan A Getting Labs
Studies of the Production of Chloramine in the Gas Phase.
Final rept.,
Charles C. Badcock, Donna J. Milgaten, and Elfreda T. Chang. 1 Jun 79, 45p TR-0078(3447)-1, SAMSO-TR-79-42
Contract F04701-77-C-0078

Descriptors: Chlorine compounds, Amines, *Synthesis(Chemistry), Amine fuels, Gases, Hydrazine, Hydrazine derivatives, Chemical reactions, Chemical reactors.
Identifiers: *Chloramine.

The gas phase reaction of NH3 and Cl2 to produce chloramine NH2Cl has been studied. The ratio of reactants (NH3/Cl2), the effects of diluent gas (N2), and the temperature of the reactants and reaction zone were investigated in a reactor designed to emphasize changes in the yield. The yield of NH2Cl and the temperature of the reacted gas stream were the key parameters monitored. The yield can be high when the ratio of reactants is low if diluent gas is used.

BDX-613-1198(Rev.) PC **A02**/MF **A01**
Bendix Corp., Kansas City, MO.
Electron Microprobe Analysis of Tantalum--Nitride Thin Films.
D. L. Stoltz, and J. P. Starkey. Jun 79, 18p
Contract EY-76-C-04-0613

Descriptors: *Electron microprobe analysis, *Films, *Microelectronic circuits, Electron probes, Modifications, Performance, Quantitative chemical analysis, Tantalum nitrides.
Identifiers: ERDA/440300.

For abstract, see ERA citation 04:045292.

7C. Organic Chemistry

AD-A070 777/8GA PC **A03**/MF **A01**
Virginia Univ Charlottesville Dept of Chemistry
Linked and Mercury-Bridged Nido-Carboranes. High-Yield Synthesis of mu, mu' -((CH3)2C2B4H5)2Hg, Conversion to 5,5'-((CH3)2C2B4H5)2, Cleavage, and Oxidative Addition of Benzene. Synthesis of mu, mu'-(B5H8)2Hg.
Technical rept.,
Narayan S. Hosmane, and Russell N. Grimes. Jun 79, 28p Rept no. TR-29
Contract N00014-75-C-0305

Descriptors: *Carboranes, *Mercury compounds, *Complex compounds, *Synthesis(Chemistry), Benzene, Addition reactions, Oxidation.

The nido-carborane anion (2,3-(CH3)2C2B4H5)(-) reacts readily with anhydrous HgCl2 in THF at room temperature, producing the bis(carboranyl) mercury(II) complex mu,mu'-((CH3)2C2B4H5)2Hg in which the metal is bound to two carborane ligands via B-Hg-B three-center, two-electron bridge bonds. On heating at 180 deg. in benzene, this compound quantitatively expels free mercury and forms the B-B linked nido-carborane 5,5'-((CH3)2C2B4H5)2 as a single pure isomer. Air oxidation of the linked carborane in benzene solution results in cleavage of the carborane-carborane B-B bond and oxidative addition of benzene to give 4-C6H5-2,3-(CH3)2C2B4H5, an apparently air-stable derivative of nido-2,3-C2B4H8. Similar treatment of the linked carborane in C6D6 gives the corresponding hexadeuterated carborane product. The reaction of B5H8 - ion with HgCl2 in THF produces mu,mu-(B5H8)2Hg, a stable solid in which mercury is evidently bridge-bonded to two pentaborane ligands. (Author)

AD-A070 926/1GA PC **A03**/MF **A01**
Virginia Univ Charlottesville Dept of Chemistry
Nickel-Boron 'Hybrid' Clusters. Synthesis of Polyhedral Nickelaboranes and Nickelacarboranes from Small Borane and Carborane Anions. Crystal Structure of (n5-C5H5)4Ni4B4H4.
Interim technical rept.,
James R. Bowser, Alan Bonny, J. Robert Pipal, and Russell Grimes. Jun 79, 47p Rept no. TR-30
Contract N00014-75-C-0305

Descriptors: *Boranes, *Carboranes, *Organometallic compounds, *Complex compounds, *Synthesis(Chemistry), Crystal structure, X ray diffraction, Infrared spectra, Mass spectra, Nuclear magnetic resonance.

Insertion of two to four nickel atoms into polyborane cages has been accomplished by reactions of metal reagents with the B5H8(-) and (CH3)2C2B4H5(-) ions in tetrahydrofuran followed by air oxidation. Treatment of NaB5H8 with NiBr2 and NaC5H5 generates closo-1,6-(Eta 5-C5H5)2Ni2B8H8 and closo-1,7-(Eta 5-C5H5)2Ni2B10H10, and the reaction of NaB5H8 with (Eta 5-C5H5)2Ni and sodium amalgam gives closo-(Eta 5-C5H5)4Ni4B4H4 and nido-(Eta 5-C5H5)4Ni4B5H5. Nickelocene and Na (CH3)2C2B4H5 yield closo-(Eta 5-C5H5)2Ni2(CH3)2C2B4H4 and nido-(Eta 5-C5H5)2Ni2(CH3)2C2B5H5. The new compounds were structurally characterized from their (11)B and (1)H pulse Fourier transform NMR, ir, and low-and-high-resolution mass spectra, and an X-ray crystal structure determination on (Eta 5-C5H5)4Ni4B4H4.

AD-A071 150/7GA PC **A02**/MF **A01**
Illinois Univ at Urbana-Champaign Dept of Chemistry
Preparation and Characterization of Polymer-Bound Polydentate Amines.
Interim technical rept.,
Russell S. Drago, and John H. Gaul. 10 Jul 79, 9p ONR-TR-2
Contract N00014-78-C-0245

Descriptors: *Amines, *Chelate compounds, *Polymers, *Catalysts, *Synthesis(Chemistry), Complex compounds, Ligands, Oxidation.
Identifiers: Multidentate aminos, Schiff base chelates.

Synthetic procedures for attaching multidentate amines to organic polymers are described. These materials form the basis for the preparation of wide variety of macrocyclic and chelating ligands that can be covalently attached to polymers. The reaction to produce Schiff base chelates is described and a series of covalently attached metal complexes prepared and identified. These systems have potential as catalysts for organic oxidations. (Author

7D. Physical Chemistry

AD-A070 539/2GA PC **A06**/MF **A01**
Army Electronics Research and Development Command Fort Belvoir VA Night Vision and Electro-Optics Labs
Physics of Mesomorphic Compounds.
Final rept. May 63-Jun 71,
Arlin J. Brown, and Reinhard D. Ennulat. Sep 78, 124p Rept no. DELNV-TR-0003

Descriptors: *Liquid crystals, *Mesomorphic compounds, Temperature sensitive elements, Transition temperature, Impurities, Phase transformations, Thermodynamic properties, Optical properties, Physical properties.
Identifiers: *Cholesterol.

This final report summarizes the physical behavior of over 200 cholesteric liquid crystals including transition temperatures, heats of transition, temperature sensitivity of visible selective reflection spectra, the effect of impurities, combining liquid crystals, and behavior in a thermal-imaging system. Eleven homologous series of alkanoates omega phenylalkanoates, alkyl carbonates, and S-alkyl thiocarbonates of cholesterol, cholest-5-en-3 Beta-thiol, and 5 alpha-cholestan-3 Beta-o1 were investigated. Twenty liquid crystals were found to have a cholesteric color spectral range of 0.2 C or less. (Author)

AD-A070 595/4GA MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Density Sensitive Lines from Selected Members of the Sodium-Like Isoelectronic Sequence,
M. Blaha, and J. Davis. Nov 77, 39p
Contracts N00014-75-C-0309, N00014-67-A-0239
Availability: Microfiche copies only.

Descriptors: *Spectral lines, *Plasmas(Physics), *Electron transitions, Electron energy, Energy levels, Calcium, Iron, Zinc, Krypton, Molybdenum, Thermal properties, Ion density, Particle collisions.

Relative intensities of spectral lines in the sodium isoelectronic sequence are presented. Results are presented for ions of calcium, iron, zinc, krypton and molybdenum for transitions between the n = 3 an n = 4 levels. (Author)

AD-A070 596/2GA PC **A03**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
The Influence of Autoionization Accompanied by Excitation on the Dielectronic Recombination and the Ionization Equilibrium of Silicon Ions,
V. L. Jacobs, J. Davis, P. C. Keppie, and M. Blaha. Oct 76, 33p

Contracts N00014-75-C-0309, N00014-67-A-0239
Prepared in cooperation with Science Applications, Inc., McLean, VA.

Descriptors: *Recombination reactions, *Silicon, *Plasmas(Physics), *Ionization, Radiative transfer, Dipole moments, Electronic states, Spectrum analysis, Photoionization, Electrical corona, Auger electrons, Electron transitions.

The dielectronic recombination rate coefficients have been calculated for the various ionization stages of silicon. Account has been taken of all stabilizing radiative transitions nd all autoionization processes which involve a single-electron electric-dipole transition of the recombining ion core. For certain ions the dielectronic recombination rates, although still larger than the direct radiative recombination rates, are found to be substantially reduced when account is taken of the effects of a previously neglected autoionization process in which the excited recombining ion core undergoes a Delta n = o transition to a lower excited state. The Temperatures at which these ions have their maximum abundance in corona equilibrium are significantly reduced when use is made of the new dielectronic recombination rates. Calculations are also presented for the total rates of radiative energy loss from isothermal steady-state plasmas due to the line and continum emission of silicon ions. (Author)

AD-A070 598/8GA PC **A02**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Line Strengths, Collison Strengths and Excitation Rates for Multiply-Charged Silicon Ions,
J. Davis, P. C. Kepple, and M. Blaha. 11 Mar 77, 24p
Contracts N00014-75-C-0309, N00014-67-A-0239

Descriptors: *Plasmas(Physics), *Silicon, Electron transitions, Spin states, Atomic energy levels, Spectral lines, Electron impact spectra.
Identifiers: Maxwell-Boltzmann density function, *Ion ion interactions.

Line strengths, collision strengths and excitation rates have been calculated for a variety of transitions in multicharged silicon ions from Si VI to Si XIV. The collision strengths were evaluated in an LS coupling scheme in the distorted wave approximation neglecting exchange except for the helium-like transitions. Excitation rates were then obtained by integrating the collision strength over a Maxwellian velocity distribution function. These results are then described by a simple two-parameter fit for the rates.

AD-A070 664/8GA PC **A03**/MF **A01**
Ohio State Univ Research Foundation Columbus
Kinetics of the Displacement Reaction between Fe and Cu2O at Temperatures between 800 and 1050 C.
Technical rept. no. 17, 15 Dec 74-15 May 79,
Gregory J. Yurek, Robert A. Rapp, and John P. Hirth. 15 May 79, 32p Rept no. OSURF-760222/784098-17
Contract N00014-75-C-0541

Descriptors: *Iron, Copper compounds, Oxides, Displacement reactions, *Reaction kinetics, Phase transformations, Solid phases, Magnetite, Matrix materials, Rods, Embedding substances, Metal films, Diffusion coefficient, Mathematical analysis.
Identifiers: *Copper oxides.

The products of the displacement reaction between solid iron and Cu2O in the temperature range of 800 to 1050 C are solid copper, wustite, and magnetite. The product oxide in contact with the iron phase is in the form of rods embedded in a matrix of copper. A thin layer of copper separates the oxide rods from the Cu2O phase. The rates of growth of the product phases are controlled by solid-state counterdiffusion of oxygen and iron through the product phases, except for the initial stage of the reaction. A previously developed kinetic model for the diffusion-controlled growth of the product phases is employed to calculate the rates of growth of each of the product phases. Theoretical values of growth rates are in excellent agreement with experimental values for temperatures above 905 C. Below 950 C, the mechanism for the growth of the magnetite phase changes, which yields marked differences between the experimental and theoretical rates of growth. The mechanism for the displacement reaction below 950 C has not been determined. (Author)

AD-A070 666/3GA PC **A02**/MF **A01**
Hawaii Inst of Geophysics Honolulu
Variable Porosity in Siliceous Skeletons: Determination and Importance,
David C. Hurd, Chiye Wenkam, H. Stuart Pankratz, and James Fugate. 18 Sep 78, 5p
Rept no. HIG-CONTRIB-933
Contract N00014-75-C-0209
Pub. in Science, v203 p1340-1343, 30 Mar 79.

Descriptors: *Silicon dioxide, Porosity, Gases, Absorption spectra, Electron microscopy, Surface properties, Geochemistry, Reprints.

No abstract available.

AD-A070 669/7GA PC **A06**/MF **A01**
Air Force Materials Lab Wright-Patterson AFB OH
Thermogravimetric Analysis of Polymers in Air.
Final rept. Nov 77-Feb 78,
Gerhard F. L. Ehlers, and Edward J. Soloski. Aug 78, 116p Rept no. AFML-TR-78-64

Descriptors: *Polymers, *Thermogravimetric analysis, Aliphatic compounds, Fluoropolymers, Aromatic compounds, Heterocyclic compounds, Nitrogen heterocyclic compounds, Silicones, Graphs, Molecular structure, Weight, Losses.

This report is concerned with the weight loss curves of 107 polymers, representative of a wide range of systems such as aliphatic, fluoroaliphatic, aromatic, heterocyclic and semiorganic, are presented. The data have been obtained in a DuPont 951 Thermogravimetric Analyzer in air at a heating rate of 20 deg. C/min. (Author)

AD-A070 686/1GA Not available NTIS
Rosenstiel School of Marine and Atmospheric Science Miami FL
Thermodynamic Models for the State of Metal Ions in Seawater,
Frank J. Millero. 1977, 41p
Contract N00014-67-A-0201-0013, Grant NSF-GA-40532
Availability: Pub. in The SEA: Ideas and Observations on Progress in the Study of the Seas, Ch17, p653-693 1977. (No copies furnished by DDC).

Descriptors: *Thermodynamics, Thermodynamic properties, Sea water, *Metals, Ions, Reprints.
Identifiers: *Mathematical models.

No abstract available.

AD-A070 728/1GA PC **A02**/MF **A01**
Cornell Univ Ithaca NY Dept of Chemistry
Collisional Deactivation of Br(42P1/2) by Hydrogen Isotopes,
J. R. Wiesenfeld, and G. L. Wolk. 26 Apr 76, 7p
Contract N00014-75-C-0828
Pub. in Jnl. of Chemical Physics, v65 n4 p1506-1510, 15 Aug 76.

Descriptors: *Bromine, *Atomic spectra, *Collisions, *Deactivation, Isotope exchange, Deuterium, Quenching, Excitation, Reprints.

No abstract available.

AD-A070 738/0GA Not available NTIS
Maryland Univ College Park Dept of Physics and Astronomy
The Influence of Autoionization Accompanied by Excitation on Dielectronic Recombination and Ionization Equilibrium,
V. L. Jacobs, J. Davis, P. C. Kepple, and M. Blaha. 4 Mar 76, 13p
Contracts N00014-75-C-0309, N00014-67-A-0239
Prepared in cooperation with Science Applications, Inc., McLean, VA and Naval Research Lab., Washington, DC. Plasma Physics Div.
Availability: Pub. in The Astrophysical Jnl., v211 p605-616, 15 Jan 77. (No copies furnished by DDC).

Descriptors: *Plasmas(Physics), *Ionization, Excitation, Recombination reactions, Equilibrium(General), Electron capture, Reprints.
Identifiers: *Autoionization.

No abstract available.

AD-A070 750/5GA PC **A03**/MF **A01**
National Measurement Lab Washington DC Polymer Science and Standards Div
Plasma Poling of Poly(Vinylidene Fluoride): Piezo- and Pyroelectric Response.
Technical rept.,
J. E. McKinney, G. T. Davis, and M. G. Broadhurst. Jun 79, 31p Rept no. TR-11
Contract N00014-79-C-0012

Descriptors: Polyvinylidenes, Fluoropolymers, *Polarization, *Crystals, Amorphous materials, Piezoelectricity, Pyroelectricity, Thermal expansion, Compressive properties, Stresses, Electric fields, Direct current.
Identifiers: Plasma poling, *Vinylidene fluoride polymers, Polymeric films.

A plasma poling technique and its use with polyvinylidene fluoride (PVDF) films is described. Specimens of biaxially drawn (blow extruded) PVDF containing both Form I (Beta) and Form II (alpha) crystals were poled under various conditions in a plasma field while the charging current was monitored to determine the polarization. Subsequently, both piezo- and pyroelectric activity were measured inorder to evaluate their magnitudes with respect to the remnant polarization (that is, the polarization remaining after returning the applied field to zero). The results are shown to be in reasonable quantitative agreement with the predictions of a model of PVDF consisting of a mixture of preferentially aligned crystals in randomized amorphous material. (Author)

AD-A070 774/5GA MF **A01**
Washington Univ Seattle Dept of Chemistry
Transients in Vibrational Relaxation of Polyatomic Molecules at High Temperatures by the Variable Encounter Method.
Technical rept.,
M. C. Flowers, D. F. Kelley, F. C. Wolters, and B. S. Rabinovitch. 15 Jun 79, 6p Rept no. NR092-549-TR010
Contract N00014-75-C-0690
Availability: Microfiche copies only.

Descriptors: *Energy transfer, *Cyclobutanes, *Polyatomic molecules, Molecular vibration, Collisions, High temperature.
Identifiers: Variable Encounter Method, Surfaces.

Temperature dependence of vibrational energy transfer efficiency in high temperature gas systems is described. The Variable Encounter Method is applied to the study of the transient region in vibrational accommodation of cyclobutane at high temperature surfaces. Collision efficiency declines with rise of temperature. Surface collisions are more efficient than binary gas phase encounters. (Author)

AD-A070 853/7GA PC **A02**/MF **A01**
California Univ Santa Barbara
Vibrational Population Distribution of Ground State BaO Formed by the Reaction Ba+O2,
Michael A. Reveili, Brian G. Wicke, and David O. Harris. 11 Dec 75, 4p AFOSR-TR-79-0266
Grants AFOSR-73-2565, NSF-MPS72-04978
Pub. in Chemical Physics Letters, v39 n3 p454-456, 1 May 76.

Descriptors: *Barium oxides, *Vibrational spectra, *Photoluminescence, *Energy levels, Laser beams, Diatomic molecules, Oxides, Halides, Reprints.

No abstract available.

AD-A070 863/6GA PC **A02**/MF **A01**
Colorado State Univ Fort Collins Dept of Physics
Ion Beam Sputtered A10xNy Encapsulating Films.
Technical rept.,
Huelya Birey, Sung-Jae Pak, J. R. Sites, and J. F. Wager. Apr 79, 22p Rept no. SF17
Contract N00014-76-C-0976

Descriptors: Aluminum compounds, Oxynitrides, *Gallium arsenides, *Encapsulation, Ion beams, Sputtering, Microscopy, Electrical conductivity, Auger electron spectroscopy, Ellipsometers, Diffusion, Impurities, High temperature, Annealing.

Identifiers: Aluminum oxynitride, Optical microscopy.

The encapsulating properties of 800-1500 A aluminum oxynitride films, deposited on GaAs by low energy ion beam sputtering, were characterized by optical microscopy, electrical conductivity, Auger profiling, and ellipsometry. The better films were found to withstand annealing to above 900 C with minimal physical deterioration. (Author)

AD-A070 879/2GA PC **A02**/MF **A01**
Northeastern Univ Boston MA Dept of Medicinal Chemistry and Pharmacology
Studies on Plasma Soluble Fluorescent Melanins.
Final rept. 1 Sep 78-30 Apr 79,
Simon H. Kuttab. 20 Jun 79, 19p
Contract N00014-78-C-0766

Descriptors: *Melanin, *Pigments, *Biochemistry, *Fluorescence, Solubility.
Identifiers: Lipofuscins, Rheomelanis, Proteins, Lipids, Molecular structure, *Chemical analysis, Chromatography, Tissue(Biology).

Plasma soluble fluroescent compounds termed rheomelanins have been isolated using paper chromatography. The fluorescent characteristic of these compounds ally them with tissue lipofuscins. Chemical composition studies using modified tissue lipofuscin histochemical tests were conducted. In addition, protein and lipid determination tests were done. All of these tests seem to indicate a strong relationship with the lipofuscins. Further experiments and investigations on the structure and content of these compounds are necessary. (Author)

AD-A070 929/5GA PC **A03**/MF **A01**
Texas Univ at Austin Dept of Chemistry
A UV Photoelectron Spectroscopic Investigation of the Bonding in Some Tri-, Tetra-, and Pentacoordinated Dialkylamino Compounds of Chromium, Molybdenum, Niobium, and Tantalum.
Technical rept.,
M. H. Chisholm, A. H. Cowley, and M. Lattman.
1979, 28p Rept no. TR-79-01
Contract N00014-76-C-0577
Prepared in cooperation with Indiana Univ., Bloomington. Dept. of Chemistry.

Descriptors: *Complex compounds, *Amines, *Chromium compounds, *Molybdenum compounds, *Niobium compounds, *Ultraviolet spectra, *Photoelectron spectra, *Chemical bonds, Alkyl radicals, Crystal structure, Transition metal compounds, Magnetic properties, Paramagnetic materials.

Helium (I) ultraviolet photoelectron spectra (UPS) are reported for the compounds CR(NPr2)3, Cr(NEt2)4, Mo(NME2)4, Mo(NEt2)4, Nb(NMe2)5, and Ta(NMe2)5. The interpretation of the UPS of the paramagnetic dialkylamide, Cr(NPr2)3, was aided by a scattered wave calculation on the model compound Cr(NH2)3. In contrast to previous UPS work on Cr(N(SiMe3)2)3, ionizations are detectable from the metal MO's of Cr(NiPr2)3. The UPS of the tetracoordinate molybdenum compounds, Mo(NR2)4, R=Me, Et are in excellent agreement with X-ray crystallographic data on Mo(NMe2)4 and exhibit a low energy ionization (approx. 5.3 eV) which is attributable to electron ejection from the essentially pure Mo 4d(x)2(-y)2 MO of b(1) symmetry. The pentacoordinate compounds, M(NMe2)5, M=Nb, Ta exhibit very similar UPS and therefore appear to be isostructural in the vapor phase.

AD-A070 976/6GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Improved Radioisotopic Assay for Cytidine 5'-Triphosphate Synthetase (EC6.3.4.2).
Medical research progress rept.,
Jim C. Williams, Harutoshi Kizaki, Emilio Weiss, and George Weber. 2 Jun 78, 17p Rept no. NMRI-78-105
Grants PHS-CA13526, PHS-CA05034
Pub. in Analytical Biochemistry, v91 p46-59 1978.

Descriptors: *Synthases, Radioactive isotopes, Bioassay, Reprints.
Identifiers: *Synthetases/cytidine-triphosphate, *Chemical analysis.

No abstract available.

AD-A070 980/8GA PC **A02**/MF **A01**
Naval Medical Research Inst Bethesda MD
Cellular Fatty Acid Composition of Vibrio Parahaemolyticus by Reversed-Phased High Performance Liquid Chromatography.
Medical research progress rept.,
L. D. Mell, Jr., S. W. Joseph, and N. E. Bussell.
1979, 13p Rept no. NMRI-79-6
Pub. in Jnl. of Liquid Chromatography, v2 n3 p407-416 1979.

Descriptors: *Liquid chromatography, *Fatty acids, Gastroenteritis, Microorganisms, Vibrio, Reprints.
Identifiers: Vibrio parahaemolyticus, *Chemical analysis, *High performance liquid chromatography.

No abstract available.

AD-A070 997/2GA PC **A02**/MF **A01**
Aerodyne Research Inc Bedford MA Center for Chemical and Environmental Physics
Quantitative Spectroscopic Studies of Boron Oxides and Fluorides.
Annual rept. 1 Apr 78-31 Mar 79,
Michael E. Gersh, and Charles E. Kolb. May 79, 24p ARI-RR-164, AFOSR-TR-79-0737
Contract F49620-77-C-0075

Descriptors: Boron compounds, *Boron oxides, Fluorides, *Infrared spectroscopy, *Absorption spectra, Coefficients, Mass spectrometry, High temperature.
Identifiers: *Boron fluorides.

The objective of this study is the measurement of the infrared absorption coefficients and absorption line spacings of several boron compounds in the gas phase over the temperature range of 300 to 1500K. In particular, the species of interest are BF3, BF, OBF, BO2, and HBO2. In the past year, the following technical progress was made. The high temperature flow reactor was developed to the point where it ran reliably at temperatures up to 1500K. The optical system was tested and operated at its design specifications. The flow reactor was interfaced to the molecular beam quadrupole mass spectrometer. A prototype discharge flow system for producing the IR active species of interest was tested. Finally, the absorption coefficients of the nu-3 band of BF3 have been measured from approximately 300 to 1500K. (Author)

AD-A071 021/0GA PC **A03**/MF **A01**
Chicago Univ IL James Franck Inst
Internal Energy Transfer in Isolated Molecules: Ergodic and Nonergodic Behavior.
Interim rept.,
Stuart A. Rice. 1978, 45p AFOSR-TR-79-0797
Contract F49620-76-C-0017

Descriptors: *Energy transfer, Molecular energy levels, Molecular states, Molecular vibration, Photons, Excitation, Emission, Chemical lasers, Molecular isomerism, Thermal properties, Statistical analysis, Equations of motion, Linear systems, Oscillators, Experimental data.
Identifiers: Intramolecular energy, Ergodic theory, Molecular force fields.

This paper addresses the following questions: (1) Under what conditions, if any, is intramolecular energy exchange slow/rapid relative to other processes, for example photon emission, or isomerization, or fragmentation; (2) How does the intramolecular energy exchange depend on the energy of the molecule and the nature of the initial excitation; (3) If there are situations for which intramolecular energy exchange is slow relative to chemical reaction, why does this behavior occur. Does it derive from special characteristics of the molecular force fields. Are there dynamical or symmetry restrictions on the spectrum of states in these cases. Are these special situations commonly or rarely found. (4) Given the answers to (3), can we devise excitation methods and reaction conditions that permit enchancement of the selectivity of the chemistry that follows. (Author)

AD-A071 044/2GA PC **A04**/MF **A01**
Aerospace Corp El Segundo CA Aerophysics Lab
Measurements of Anomalous Dispersion of HF in Absorption.
Interim rept.,
Rolf W. F. Gross, Richard A. Chodzko, Eugene B. Turner, and John G. Coffer. 15 Jun 79, 51p TR-0079(4764)-2, SAMSO-TR-79-44
Contract F04701-78-C-0079

Descriptors: *Hydrogen fluoride, *Absorption spectra, *Molecular spectroscopy, *Molecular energy levels, Radiation absorption, Hydrogen fluoride lasers, Tunable lasers, Laser cavities, Infrared spectroscopy, Dispersion relations.
Identifiers: Anomalous dispersion, Mach-Zehnder interferometers, Vibrational transitions, Absorption cells, Middle infrared region, Line scanning, Doppler broadening, Infrared interferometers, Vibration states.

The quantitative measurement of the anomalous dispersion of the P1(6), P1(7), and P1(8) vibration-rotation transitions of hydrogen-fluoride (HF) in absorption are reported. The measurements were performed with a small, line-selectable HF laser equipped with a piezoelectrically frequency-scanned cavity that illuminated a Mach-Zehnder interferometer, one arm of which contained the HF absorption cell. The fringes produced by the interferometer and their dispersion-induced shift were observed directly with the help of a rotating mirror and an ir detector. This interferometer technique has an ultimate noise-limited sensitivity of 0.02 of a fringe spacing at 2.7 micron. Measurements also are given for the absorption coefficient at line center for the same three P1 lines of HF. Both dispersion and absorption measurements are for a pressure range of 0.05 to 10 Torr of pure HF at room temperature, so the absorption lines were Doppler broadened. The measured values for the absorption coefficient and the slope of the dispersion curve at line center and for the maximum excursion of the anomalous refractive index are in excellent agreement with calculated values for these quantities. (Author)

AD-A071 045/9GA PC **A02**/MF **A01**
National Bureau of Standards Washington DC Surface Science Div
13 C NMR of CO Chemisorbed onto Dispersed Rhodium.
Technical rept.,
T. M. Duncan, J. T. Yates, Jr., and R. W. Vaughan. Jun 79, 8p Rept no. TR-14
Contracts N00014-79-F-0014, N00014-77-F-0008
Prepared in cooperation with California Inst. of Tech., Pasadena. Div. of Chemistry and Chemical Engineering, Contract N00014-75-C-0960.

Descriptors: *Chemisorption, *Transition metals, *Nuclear magnetic resonance, *Carbon monoxide, Molecules, Infrared spectroscopy, Infrared spectrometers, Hydrogen, Catalysts, Solid state chemistry, Rhodium, Dispersions, Measurement.

13C NMR spectrum of carbon monoxide chemisorbed on supported rhodium has been studied. Temperature dependent lineshape changes have been observed suggesting that anisotropic carbon monoxide motions occur in the chemisorbed layer. (Author)

AD-A071 089/7GA PC **A02**/MF **A01**
Massachusetts Inst of Tech Cambridge Dept of Chemistry
Stimulated Emission Spectroscopy with an Optically Pumped I2 Laser,
J. Brooke Koffend, Roger Bacis, and Robert W. Field. 1979, 15p AFOSR-TR-79-0816
Contract AFOSR-76-3056
Pub. in SPIE Proceedings for the International Conference on Lasers '78, v168 n146 1979.
Availability: Microfiche copies only.

Descriptors: *Molecular lasers, *Emission spectroscopy, *Optical pumping, *Iodine, *Excitation, Doppler systems, Argon lasers, Lenses, Hyperfine structure, Molecular vibration, Interactions, Oscillation, Chemical lasers, Nuclear spins, Diatomic molecules, Continuous wave lasers, Reprints.
Identifiers: Expected value.

No abstract available.

AD-A071 109/3GA PC **A05**/MF **A01**
Life Systems Inc Cleveland OH
Evaluation of an Electrochemical Biocide.
Final rept. Jun 74-Nov 78,
J. B. Lantz, and K. A. Burke. Nov 78, 83p Rept no. LSI-ER-289-5

Contract DAMD17-74-C-4102

Descriptors: *Biocides, Waste treatment, Electrochemistry, *Sewage treatment, Waste water, Costs, Purification, Electrolysis.

An alternate disinfecting process to chemical agents, heat and radiation in an aqueous media has been studied. The process is called an Electrochemical Biocide and employs cyclic, low level voltages at chemically-inert electrodes to pass alternating current through water and, in the process, destroy microorganisms present. The results of continuing development efforts are reported. The process was shown to be effective against two disinfection resistant microorganisms, flow-past electrodes were shown to be fouling-resistant, and the process was additionally characterized for effects of power parameters, operating modes and membrane isolation of the electrode surface. Flow-through reactors were developed and tested, showing that superior mass transport of microorganisms was achieved at low concentrations. Continuous single-pass processing was demonstrated with a newly-developed multiple cell, flow-through Electrochemical Biocide module, a special continuous culture test stand and a new extended range power supply. An economic analysis and cost comparison study showed that the Electrochemical Biocide could be cost competitive for disinfection of low volume wastewater sources. (Author)

AD-A071 138/2GA PC **A08**/MF **A01**
Baylor Coll of Medicine Houston TX
Analysis of Biologic Samples for Morphine and Morphine-Related Compounds by Gas Chromatographic-Mass Spectrometric Methods.
Final rept.,
E. C. Horning, J. P. Thenot, and M. G. Horning.
Apr 76, 151p
Contract DAMD17-74-C-4052

Descriptors: *Morphine, *Heroin, Gas chromatography, Mass spectroscopy, Ionization, Ions, Detection, Metabolism.
Identifiers: Codeine, Normorphine, Morphine/acetyl, Morphine/dimethyl, Morphine/diethyl, *Bioassay, *Chemical analysis, Computer aided analysis, Urine, Blood chemical analysis, Procedures.

Methods were investigated for the analysis of biologic samples containing morphinee and morphine-related compounds through use of bioanalytical systems involving gas chromatograph-mass spectrometer-computer combined instruments. Most of the work was carried out with a quadrupole mass spectrometer designed for chemical ionization work. Methane was used as the reagent gas. The studies included the synthesis of stable isotope labeled compounds and derivatives of morphine and morphine-related compounds, and the development of analytical procedures for the determination of free and total morphine and morphine-related compounds in biologic samples. Mass spectral studies were carried out by electron impact ionization, chemical ionization (0.5-1 Torr) and atmospheric pressure ionization mass spectrometry. The procedures were applied in the analysis of a large number of urinary and blood (serum, plasma) samples. Methods based upon gas chromatograph-mass spectrometer-computer bioanalytical systems show high specificity and high sensitivity in detection, and are generally regarded as reference methods of analysis. The general procedures developed in the course of this work can be used in other applications. (Author)

AD-A071 151/5GA PC **A02**/MF **A01**
Illinois Univ at Urbana-Champaign Dept of Chemistry
Chemiluminescence of Diphenoyl Peroxide. Pulsed Laser Spectrophotometric Detection of Radical Ion Intermediates on the CIEEL Path.
Technical rept.,
Gary B. Schuster, and Keith A. Horn. 5 Jul 79, 15p
Contract N00014-76-C-0745-21

Descriptors: *Chemiluminescence, *Peroxides, *Organic oxygen compounds, *Electron transfer, *Phenanthrenes, Excitation, Reaction kinetics, Ions, Hydrocarbons, Pulsed lasers, Spectrophotometry.
Identifiers: Chemically Initiated Electron Exchange Luminescence, Diphenoyl peroxide, Pyrene, Laser enhanced reactions.

The reactions of diphenoyl peroxide with a series of electronically excited state hydrocarbon reactants was investigated by pulsed laser spectrophotometry. It was found that the primary reaction between the excited state and the peroxide is electron transfer to generate a radical ion pair. The ions were detected by their characteristic absorption spectra. The reaction kinetics were measured and used to verify the generation of radical ion intermediates in the chemically initiated electron-exchange luminescence (CIEEL) mechanism for the chemiluminescence of organic peroxides. (Author)

AD-A071 179/6GA PC **A03**/MF **A01**
California Univ Los Angeles Dept of Chemistry
Optical Detection of Spectral Diffusion of the Triplet State Zerofield Transition Energy.
Technical rept.,
William M. Pitts, and M. A. El-Sayed. Jul 79, 36p
Rept no. TR-35
Contract N00014-75-C-0602

Descriptors: *Spin states, *Electron transitions, *Optical detection, *Spectral emittance, Transitions, Diffusion, Phosphorescence, Microwaves.
Identifiers: Electron electron double resonance, Spectral diffusion.

Pulsed EEDOR experiments using optical detection have been developed and utilized to study spectral diffusion within the inhomogeneously broadened zerofield spin transition of a photoexcited triplet molecule. Two distinct spectral diffusion processes have been observed. One is very fast and is the source of the rapid loss of spin coherence previously observed in spin echo experiments of photoexcited triplet molecules. This rapid spectral diffusion seems to be limited to a narrow range of frequencies within the inhomogeneous profile of the spin transition. The second phase is considerably slower, but can sample a greater range of frequencies within the inhomogeneous profile. This second spin diffusion process determines the minimum hole width which can be observed in a steady state EEDOR experiment. (Author)

AD-A071 199/4GA PC **A02**/MF **A01**
Ohio State Univ Research Foundation Columbus
Solid-State Displacement Reactions between Selected Metals and Sulfides.
Technical rept.,
S. R. Shatynski, John P. Hirth, and R. A. Rapp.
14 Aug 78, 11p Rept nos. OSURF-760222/784098, OSURF-TR-18
Contract N00014-75-C-0541
Prepared in cooperation with Rensselaer Polytechnic Inst., Troy, NY. Pub. in Metallurgical Transactions A, v10A p591-598 May 79.

Descriptors: *Displacement reactions, *Solid state chemistry, *Reaction kinetics, *Chemical reactions, Metals, Sulfides, Sulfidization, Theory, Manganese, Thermodynamic properties, Copper sulfides, Phase transformations, Reprints.

No abstract available.

BNL-50944 PC **A04**/MF **A01**
Brookhaven National Lab., Upton, NY.
Regenerative Process for Desulfurization of High Temperature Combustion and Fuel Gases. Quarterly Progress Report No. 10, July 1--September 30, 1978.
M. S. Shen, and J. M. Chen. 1978, 72p
Contract EY-76-C-02-0016

Descriptors: *Calcium silicates, *Fluidized-bed combustion, *Limestone, Chemical reactions, Coal, Comparative evaluations, Diagrams, Economics, Experimental data, Mathematical models, Numerical data, Regeneration, Sorptive properties.
Identifiers: ERDA/010800, ERDA/010402, *Air pollution control, Waste recycling, Capitalized costs, Reaction kinetics, High temperature tests, Operating costs, Sulfur dioxide, Combustion products, Industrial wastes.

For abstract, see ERA citation 04:044246.

CONF-781039-2 PC **A02**/MF **A01**
Argonne National Lab., IL.
Ab Initio Quantum Mechanical Characterization of the 7 beta , 8 alpha , 9 alpha -Trihydroxy-7, 8, 9-Trihydrobenzo(A)Pyrene Carbonium Ion.
L. L. Shipman. 1978, 21p
Contract W-31-109-ENG-48
Symposium on polynuclear aromatic hydrocarbons, Columbus, OH, USA, Oct 1978.

Descriptors: *Condensed aromatics, Cations, Electronic structure, Molecular orbital method, *Quantum mechanics.
Identifiers: ERDA/400301, *Carbonium ions, *Benzopyrene/trihydro-trihydroxy.

For abstract, see ERA citation 04:031009.

CONF-790442-12 PC **A02**/MF **A01**
Argonne National Lab., IL.
Thermal Stability and Decomposition Kinetics of Amorphous Hydrogenated Films.
J. A. McMillan, and E. M. Peterson. 1979, 13p
Contract W-31-109-ENG-38
International conference on metallurgical coatings, San Diego, CA, USA, 23 Apr 1979.

Descriptors: *Silanes, Silicon, Amorphous state, Chemical analysis, Chemical reactions, Decomposition, Electric discharges, Enthalpy, Entropy, Films, Hydrogenation, Pyrolysis, Sample preparation, Silicon solar cells, Sputtering.
Identifiers: ERDA/140501, ERDA/360603, *Reaction kinetics, *Decomposition, *Thermal stability.

For abstract, see ERA citation 04:044482.

CONF-790524-3 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Fate of Electrons with Energies Less Than 100 EV.
J. A. D. Stockdale. 1978, 9p
Contract W-7405-ENG-26
International congress symposium on radiation research and stem cells, Tokyo, Japan, 13 May 1979.

Descriptors: *Electron-molecule collisions, Dissociation, Electron attachment, Electrons, Ev range 01-10, Ev range 10-100, Excitation, Resonance, Rotational states, Vibrational states, Water.
Identifiers: ERDA/640304.

For abstract, see ERA citation 04:043921.

COO-2542-6 PC **A02**/MF **A01**
Princeton Univ., NJ. Dept. of Chemistry.
Dynamical Studies of Molecular Systems. Progress Report, February 1, 1978--November 1, 1978.
H. Rabitz. 1978, 18p
Contract EY-76-S-02-2542

Descriptors: *Molecule collisions, Atom collisions, Carbon monoxide, Chemical reaction kinetics, Correlations, Excitation, Green function, Helium, Hydrogen, Hydrogen deuteride, Inelastic scattering, Quantum mechanics, Relaxation, Research programs, Rotational states, Sodium, Symmetry, Time dependence, Vibrational states, Xenon.
Identifiers: ERDA/640304.

For abstract, see ERA citation 04:043922.

COO-2718-7 PC **A02**/MF **A01**
Missouri Univ.-St. Louis.
Observation of Luminescent Spectra in Low Energy Ion-Neutral Collisions. Progress Report, June 1, 1978--May 31, 1979.
J. J. Leventhal. Feb 79, 22p
Contract EY-76-S-02-2718

Descriptors: *Atom collisions, *Ion-atom collisions, *Molecule collisions, *Sodium, Atom-atom collisions, Emission spectra, Energy transfer, Excitation, Experimental data, Graphs, Ions, Isolated values, Lasers, Luminescence, Potential energy, Research programs.
Identifiers: ERDA/640304.

For abstract, see ERA citation 04:039791.

COO-2753-101 PC **A02**/MF **A01**
Kansas State Univ., Manhattan. Dept. of Physics.
Role of Relativistic Effects and Configuration Mixing on the 1S2S3P exp 4 P (J=5/2) State of Argon.
T. W. Tunnell, C. Can, and C. P. Bhalla. 1978, 3p
CONF-781113-39
Contract EY-76-S-02-2753
Conference on application of small accelerators, Denton, TX, USA, 6 Nov 1978.

Descriptors: *Argon, Auger effect, Configuration mixing, D states, Energy levels, Energy-level transitions, Fluorescence, Forbidden transitions, Inner-shell ionization, Isolated values, Matrix elements, Multipoles, P states, Relativistic range, Selection rules, Spin, Theoretical data.
Identifiers: ERDA/640302.

For abstract, see ERA citation 04:041807.

COO-2753-102 PC **A02**/MF **A01**
Kansas State Univ., Manhattan. Dept. of Physics.
Theoretical Lifetimes and Fluorescence Yields for Multiply-Ionized Fluorine.
T. W. Tunnell, C. Can, and C. P. Bhalla. 1978, 6p CONF-781113-38
Contract EY-76-S-02-2753
Conference on application of small accelerators, Denton, TX, USA, 6 Nov 1978.

Descriptors: *Fluorine ions, Auger effect, Configuration interaction, Coupling, Energy-level transitions, Fluorescence, Inner-shell ionization, K shell, Lifetime, Multicharged ions, Multiplets, Tables, Theoretical data.
Identifiers: ERDA/640302.

For abstract, see ERA citation 04:041808.

COO-2753-103 PC **A02**/MF **A01**
Kansas State Univ., Manhattan. Dept. of Physics.
X-Ray Production and Electron Transfer Cross Sections for 0.4 to 2.2 MeV/Amu N, O, and F Ions on Al.
T. J. Gray, P. Richard, G. Gealy, J. Newcomb, and H. Tawara. 1978, 3p CONF-781113-37
Contract EY-76-S-02-2753
Conference on application of small accelerators, Denton, TX, USA, 6 Nov 1978.

Descriptors: *Aluminium, *Fluorine ions, *Nitrogen ions, *Oxygen ions, Collisions, Cross sections, Energy dependence, Fluorescence, Ion collisions, K shell, X-ray spectra.
Identifiers: ERDA/640301.

For abstract, see ERA citation 04:041798.

COO-4388-3 PC **A03**/MF **A01**
Dynatech R/D Co., Cambridge, MA.
Acetic Acid Production from Marine Algae. Progress Report No. 3, January 1, 1978--March 31, 1978.
J. E. Sanderson, and D. L. Wise. 1 Jun 78, 35p
Contract EG-77-C-02-4388

Descriptors: *Acetic acid, *Algae, Anaerobic digestion, Biochemical reaction kinetics, Biosynthesis, Carboxylic acids, Efficiency, Membranes, Mesophilic conditions, Methane, Research programs, Solvent extraction, Thermophilic conditions.
Identifiers: ERDA/140504, ERDA/090122.

For abstract, see ERA citation 04:040538.

COO-4691-1 PC **A03**/MF **A01**
Pittsburgh Univ., PA.
Screening of Zeolite Catalysts for Methanol Conversion to Light Hydrocarbons. Final Report, January 1--September 30, 1978.
J. T. Cobb, Jr., V. T. Coon, and P. Tipnis. Sep 78, 36p
Contract EW-78-S-02-4691

Descriptors: *Catalysts, *Hydrocarbons, Aging, Alkanes, Alkenes, Deactivation, Methanol, Regeneration, Research programs, Screening, Synthesis, Temperature dependence, Time dependence.
Identifiers: ERDA/090121, *Zeolites, Ion exchanging resins, Performance evaluation, X ray diffraction, Samples.

For abstract, see ERA citation 04:042507.

DOE/ET/10320-1 PC **A03**/MF **A01**
Tufts Univ., Medford, MA. Dept. of Chemical Engineering.
Studies for the Stabilization of Coal--Oil Slurries (COM). Technical Progress Report , August--November 1978.
G. D. Botsaris, Y. M. Glazman, R. Z. Naar, and M. A. Viola. 29 Nov 78, 30p
Contract ET-78-S-01-3128

Descriptors: *Coal, *Fuel slurries, Fuel oils, Mixtures, Stabilization, Surface properties.
Identifiers: ERDA/014000, ERDA/025000.

For abstract, see ERA citation 04:044268.

EPRI-EA-1031(V.2) PC **A04**/MF **A01**
Radian Corp., Austin, TX.
Nitrogen Oxide Interferences in the Measurement of Atmospheric Particulate Nitrates.
L. A. Rohlack, W. C. Hawn, K. R. Williams, and T. P. Parsons. Mar 79, 74p

Descriptors: *Air filters, *Fiberglass, *Nitrates, *Nitric oxide, *Nitrous oxide, *Ozone, *Polycarbonates, *Teflon, Air pollution, Earth atmosphere, Humidity, Interfering elements, Monitoring, Performance testing, Sorptive properties, Temperature dependence.
Identifiers: ERDA/500200, *Air pollution sampling, Gas analysis, Chemical analysis, Concentration(Composition).

For abstract, see ERA citation 04:041585.

FE-2240-96 PC **A03**/MF **A01**
Braun (C.F.) and Co., Alhambra, CA.
Fixed Bed Methanation Processes. Final Report.
V. P. Sirohi. Aug 78, 36p
Contract EX-76-C-01-2240

Descriptors: *Methanation, *Synthesis gas, Calorific value, *Catalysts, Catalytic effects, Coal gasification, Comparative evaluations, Cost, Fuel gas, Heat recovery, Nickel. Packed bed, Reaction heat, Recommendations, Temperature control.
Identifiers: ERDA/010404, ERDA/320304, High pressure tests.

For abstract, see ERA citation 04:042163.

FE-2276-21 PC **A04**/MF **A01**
Mobil Research and Development Corp., Paulsboro, NJ.
Development Studies on Selected Conversion of Synthesis Gas from Coal to High Octane Gasoline. Quarterly Report, January--March 1978.
J. A. Brennan. Apr 78, 63p
Contract EX-76-C-01-2276

Descriptors: *Catalysts, *Gasoline, *Methanol, Aging, Coal gasification, Performance, Regeneration, Synthesis, Synthesis gas.
Identifiers: ERDA/090121, ERDA/090222, ERDA/010404, *SG-A-3 catalyst.

For abstract, see ERA citation 04:042508.

FE-2278-11 PC **A02**/MF **A01**
Oklahoma State Univ., Stillwater. School of Chemical Engineering.
Phase Equilibrium and Volumetric Properties of Coal-Derived Fluids. Quarterly Report, September 16--December 15, 1978.
R. L. Robinson, Jr. 1978, 16p
Contract EX-76-C-01-2278

Descriptors: *Carbon dioxide, *Hydrogen, *Methane, Binary mixtures, Compressibility, Diagrams, Equations of state, Equilibrium, Ethane, Experimental data, Physical properties, Propane, Tables, Toluene.
Identifiers: ERDA/010600, ERDA/010404, ERDA/010405, Naphthalene/methyl.

For abstract, see ERA citation 04:044240.

IS-T-834 PC **A04**/MF **A01**
Ames Lab., IA.
Inductively Coupled Plasma--Atomic Emission Spectroscopy: An Evaluation of the Use of Nitrogen--Argon Admixtures as Plasma Discharge Atmospheres.
J. C. Zalewski. Jan 79, 67p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Emission spectroscopy, Argon, Evaluation, Mixtures, Nitrogen, Physical properties.
Identifiers: ERDA/400104, *Plasma spectroscopy.

For abstract, see ERA citation 04:034324.

IS-T-850 PC **A10**/MF **A01**
Ames Lab., IA.
Kinetic Models for Irreversible Processes on a Lattice.
N. O. Wolf. Apr 79, 225p
Contract W-7405-ENG-82
Thesis.

Descriptors: *Chemisorption, *Crystal lattices, *Methane, *Tungsten, Equations, *Mathematical models, Mechanics, One-dimensional calculations, Sorptive properties.
Identifiers: ERDA/656102, ERDA/360104.

For abstract, see ERA citation 04:044057.

LA-UR-78-2397 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Relationship Between the Feasible Group and the Point Group of a Rigid Molecule.
J. D. Louck. 1978, 17p CONF-780768-1
Contract W-7405-ENG-36
Conference on permutation group and its applications in physics and chemistry, Bielefeld, F.R. Germany, 3 Jul 1978.

Descriptors: *Molecules, Group theory, Reviews.
Identifiers: ERDA/640305.

For abstract, see ERA citation 04:028297.

LA-UR-79-1235 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Atomic Capture of Negative Mesons in Hydrogen.
M. Leon. 1979, 7p
Contract W-7405-ENG-36

Descriptors: *Hydrogen, *Muonic atoms, Atomic models, Atoms, Capture, Classical mechanics, Cross sections, Distribution, Energy spectra, Isolated values, Molecular ions, Muons minus, Quantum mechanics, Recoils, Theoretical data.
Identifiers: ERDA/640305.

For abstract, see ERA citation 04:043932.

LA-UR-79-660 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Partial Photoionization Cross Sections and Radiative Recombination Rate Coefficients for Li-Like Ions - II.
W. D. Barfield. 1979, 20p
Contract W-7405-ENG-36

Descriptors: *Aluminium ions, *Carbon ions, *Iron ions, *Molybdenum ions, *Oxygen ions, Cross sections, Energy-level transitions, Graphs, Isoelectronic atoms, Multicharged ions, Multipoles, Photoionization, Recombination, Self-consistent field, Solar corona, Tables, Theoretical data, Tokamak devices, Wave functions.
Identifiers: ERDA/640302.

For abstract, see ERA citation 04:043909.

LA-7774-T PC **A11**/MF **A01**
Los Alamos Scientific Lab., NM.
Kinetics and Thermodynamics of Nickel (II): Glycine Complexes Using Carbon Magnetic Resonance.
D. F. Shepard. Apr 79, 234p
Contract W-7405-ENG-36
Thesis.

Descriptors: *Carbon 13, *Nickel complexes, Activation energy, Amines, Complexes, Experimental data, Glycine, Isolated values, Nuclear magnetic resonance, *Thermodynamic properties.
Identifiers: ERDA/400201, *Reaction kinetics.

For abstract, see ERA citation 04:043517.

LBL-7687 PC **A07**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Reactive and Nonreactive Scattering of Modulated Molecular BEAMS from Well Characterized Platinum Single Crystal Surfaces.
R. J. Gale. Dec 78, 150p
Contract W-7405-ENG-48
Thesis.

Descriptors: *Helium, *Hydrogen, *Platinum, Adsorption, Angular distribution, Atom collisions, Collisions, Deuterium, Experimental data, Gases, Isolated values, Kinetics, Mass spectroscopy, Modulation, Molecular beams, Potential scattering, Probability, Recombination, Surface potential, Sur-

faces, Temperature dependence, Ultrahigh vacuum, Variations.
Identifiers: ERDA/640301.

For abstract, see ERA citation 04:039772.

LBL-8932 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Charge Changing Cross Sections for Heavy Ions at Energies to 8.5 MeV/Amu.
J. Alonso, D. Dietrich, and H. Gould. Mar 79, 4p CONF-790327-91
Contract W-7405-ENG-48
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Argon ions, *Iron ions, *Krypton ions, *Xenon ions, Cross sections, Electron attachment, Electron loss, Electron transfer, Electrons, Experimental data, Graphs, Ion-molecule collisions, Isolated values, Mev range 01-10, Nitrogen.
Identifiers: ERDA/640304.

For abstract, see ERA citation 04:039795.

N79-28258/8GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
The Role of NaCl in Flame Chemistry, in the Deposition Process, and in Its Reactions with Protective Oxides as Related to Hot Corrosion.
F. J. Kohl, and C. A. Stearns. 1979, 27p NASA-TM-79225, E-120
Conf-Prepared for 4th Conf. On Gas Turbine Materials in a Marine Environment, Annapolis, MD, 25-28 Jun. 1979.

Descriptors: *Chemical reactions, *Corrosion, *Flame propagation, *Sodium chlorides, Chemical attack, Combustion, Mass spectroscopy, Oxidation, Sodium sulfates.
Identifiers: Turbine engines.

For abstract, see STAR 1719

N79-28259/6GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Chemical Kinetic Modeling of Benzene and Toluene Oxidation Behind Shock Waves.
A. G. McLain, C. J. Jachimowski, and C. H. Wilson. Aug 79, 26p NASA-TP-1472, L-12803

Descriptors: *Benzene, *Oxidation, *Reaction kinetics, *Shock waves, *Toluene, Carbon dioxide concentration, Carbon monoxide, Computerized simulation, Nitrous oxides, Shock tubes, Stoichiometry.

For abstract, see STAR 1719

N79-28272/9GA PC **A02**/MF **A01**
Research Inst. of National Defence, Stockholm (Sweden).
Jaemviktsfaser I Systemen B-C, B-Si och B-C-Si. En Litteraturundersoekning (Balance Phases in the Systems B-C, B-Si and B-C-Si. A Literature Investigation),
F. Hopfgarten, and B. Holmberg. May 78, 25p FOA-C-20240-D6
Language in Swedish.

Descriptors: Boron compounds, Phase diagrams, Stoichiometry, *Boron carbides, Silicon.
Identifiers: *Boron silicides.

For abstract, see STAR 1719

N79-28457/6GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Prediction of Expansion-Tube Flow Conditions Using a Nondimensional Velocity Number.
N. M. Reddy. Jun 79, 37p NASA-TM-80128

Descriptors: *Gas expansion, *Gas flow, *Shock tubes, Air, Argon, Carbon dioxide, Equations of state, Neon, Real gases, Shock waves.

For abstract, see STAR 1719

ORNL/MIT-283 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Mass Transfer in Three-Phase Fluidized Beds.
F. V. Gay, C. B. Holtman, and N. F. Sheppard. 21 Dec 78, 34p
Contract W-7405-ENG-26

Descriptors: *Fluidized bed, Bench-scale experiments, *Mass transfer.
Identifiers: ERDA/420400.

For abstract, see ERA citation 04:043619.

UCRL-13962 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Development of High Current Low Energy H exp + Ion Source.
A. T. Forrester, J. T. Crow, and D. M. Goebel. 1978, 20p
Contract W-7405-ENG-48

Descriptors: *Deuterium ions, *Hydrogen ions 1 minus, *Hydrogen ions 1 plus, *Ion sources, Beam emittance, Beam extraction, Grids, Milli amp beam currents, Performance.
Identifiers: ERDA/640301.

For abstract, see ERA citation 04:041800.

UCRL-81374 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Neptunium(V) Anionic Exchange in Sulfate-Sulfuric Acid Solutions.
J. Rego, J. Garrison, and R. Carver. 2 May 79, 5p CONF-790415-33
Contract W-7405-ENG-48
177. ACS national meeting, Honolulu, HI, USA, 1 Apr 1979.

Descriptors: *Neptunium, Ion exchange, Organic ion exchangers, Sulfates, Sulfuric acid.
Identifiers: ERDA/400105, Separation, Adsorption.

For abstract, see ERA citation 04:043513.

UCRL-82332 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Exp 35 Cl and exp 81 Br Nuclear Magnetic Resonance Studies of Carbonic Anhydrase.
R. L. Ward. Feb 79, 25p CONF-790439-1
Contract W-7405-ENG-48
Symposium on biophysics and physiology of carbon dioxide, Regensburg, F.R. Germany, 17 Apr 1979.

Descriptors: *Carbonic anhydrase, Biochemical reaction kinetics, Bromine 81, Chlorine 35, Nuclear magnetic resonance, Temperature dependence.
Identifiers: ERDA/400301.

For abstract, see ERA citation 04:043537.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-A070 915/4GA PC **A02**/MF **A01**
Johns Hopkins Univ Baltimore MD
Studies of Walrus and Whales.
Technical rept.,
G. Carleton Ray. 24 Oct 77, 10p Rept no. TR-17
Contract N00014-75-C-0701

Descriptors: *Marine biology, Mammals, Marine biological noise, Feces, Infectious diseases, Biological rhythms, *Whales, Oceanographic data, *Chukchi Sea, Benthonic zone.
Identifiers: *Walruses, Trichinosis, Animal behavior, Marking, Radio telemetry, Concentration(Composition), Birds, Icebreakers, Cetacea, AGB4 vessel.

A preliminary report is made of the results obtained on a marine mammal expedition aboard the USCGC Icebreaker Glacier in the Chukchi Sea in July 1977. Observations on hauling-out rhythms, radio tagging, underwater vocalizations, on-ice behavior and herd structure of walruses are presented. A variety of student projects, including transmission of trichinosis, benthic and water column sampling, walrus feces composition, and bird copraphagy are summarized. (Author)

AD-A070 916/2GA PC **A02**/MF **A01**
Johns Hopkins Univ Baltimore MD
Abstracts of Papers Presented at Conference on the Biology of Marine Mammals (2nd) San Diego, CA 12-15 December 1977.
Technical rept.,
G. Carleton Ray, Douglas Wartzok, Rodney V. Salm, James A. Dobbin, and John C. Beier. 1977, 5p Rept no. TR-18
Contract N00014-75-C-0701

Descriptors: *Abstracts, Marine biology, *Mammals, Seals(Mammals).
Identifiers: Animal behavior, Odobenus rosmarus, Reproduction(Biology), Phocalargha, Chukchi Sea, Erignathus barbatus,I *Walrus, Habitats.

The titles of the abstracts included are as follows; (1) Insights into the Natural History of the Pacific Walrus; (2) An Approach to Analysis of Critical Habitat of the Pacific Walrus, 'Odobenus rosmarus divergens; (3) Mating Behavior of Captive Spotted Seals ('Phoca largha'); (4) Agonistic Behavior of Walrus in the Chukchi Sea in Summer; and (5) Necropsy Findings in a Bearded Seal, 'Erignathus barbatus'.

AD-A070 998/0GA PC **A02**/MF **A01**
Johns Hopkins Univ Baltimore MD Dept of Pathobiology
Radio Tracking of a Fin Whale 'Balaenoptera physalus',
G. C. Ray, E. D. Mitchell, D. Wartzok, V. M. Kozicki, and R. Maiefski. 26 Apr 78, 7p Rept no. TR-14
Contracts N00014-75-C-0701, NAS2-9300
Pub. in Science, v202 p521-524, 3 Nov 78.

Descriptors: *Whales, Tracking, Radio equipment, Respiration, Radio transmitters, Reprints.
Identifiers: Balaenoptera physalus.

No abstract available.

AD-A070 999/8GA PC **A02**/MF **A01**
Johns Hopkins Univ Baltimore MD Dept of Pathology
Parasite-Related Lesions in a Bearded Seal, 'Erignathus barbatus',
Lynn Bishop. 24 Jul 78, 11p Rept no. TR-15
Contract N00014-75-C-0701, Grant PHS-RR-05007
Pub. in Jnl. of Wildlife Diseases, v15 p285-293 Apr 79.

Descriptors: *Parasitic diseases, *Seals(Mammals), Lesions, Autopsy, Necrosis, Trematodes, Nematoda, Reprints.
Identifiers: Cestodes, *Erignathus barbatus.

No abstract available.

AD-A071 000/4GA PC **A02**/MF **A01**
Johns Hopkins Univ Baltimore MD Dept of Pathobiology
Color Discrimination by a Bering Sea Spotted Seal, 'Phoca largha',
Douglas Wartzok, and M. Geraldine McCormick. 15 Dec 76, 6p Rept no. TR-16
Contract N00014-75-C-0701
Pub. in Vision Research, v18 p781-784 1978.

Descriptors: *Seals(Mammals), *Color vision, Discrimination, Target discrimination, Orange, Blue, Brightness, Reprints.
Identifiers: *Phoca largha.

No abstract available.

PB-298 921/8GA PC **A02**
Oregon State Univ., Corvallis. School of Oceanography.
The Relationship of Seasonal Changes in the Biochemical Components to the Reproductive Behavior of the Intertidal Sponge, 'Haliclona permollis',
David W. Elvin. Feb 79, 18p ORESU-R-79-002, NOAA-79070609
Grant NOAA-04-3-158-4
Pub. in Biological Bulletin, v156 p47-61 Feb 79.

Descriptors: *Porifera, *Reproduction(Biology), *Biochemistry, *Intertidal zone, Growth, Proteins, Lipids, Males, Females, Life cycles, Oregon.
Identifiers: Sea Grant program, *Haliclona permollis, Predators, Diaulula sandiegenesis, Reprints.

Biochemical requirements for growth and reproduction in the intertidal sponge, Haliclona permol-

lis, were estimated by following the total amounts of protein, lipid, glycogen, RNA, and DNA. The ratio of total organic weight to spicule weight and the histological volume per unit spicule weight were also followed seasonally. Protein and lipid accumulation in females began in February before oocytes were observed. Lipids were consumed during embryogenesis. Following the reproductive period, females continued to have greater accumulation of protein and lipids than males. The proportion of protein relegated to reproductive functions averages 8% of the total and can rise to 30% in females. The life cycle strategy of this population appears to place most of the synthetic and accumulative efforts into fall somatic growth and spreading in order to allow increased survival over the winter and subsequent reproduction in the spring. The sponge appears to be a particularly good source of protein for its principle predator, Diaulula sandiegenesis.

PB-298 925/9GA PC **A02**
Rhode Island Univ., Kingston. Dept. of Zoology.
Some Factors Influencing the Outcome of Shelter Competition in Lobsters ('Homarus americanus'),
D. J. O'Neill, and J. S. Cobb. 27 Jul 78, 15p
MARINE REPRINT-116, NOAA-79061901
Grant NOAA-04-8-M01-147
Pub. in Marine Behavior Physiology, v6 p33-45 1979.

Descriptors: *Lobsters, *Shelters, Competition, Size determination, Males, Animal behavior, Morphology, Stress(Physiology), Field tests, Rhode Island.
Identifiers: Reprints, Homarus americana, Sea Grant program, Dominance.

Some factors involved in the competition for shelter between lobsters 40-70mm carapace length were examined in the field and in the laboratory. Dominance, usually indicated by greater carapace length, male sex, hard exo-skeleton and a numerical or length advantage in claws increased the likelihood of capturing and holding a shelter. Prior residence in the shelter, right or left position of the crusher claw, or absence of both antennae did not influence the outcome of the shelter competition. Sharing of shelter was rare except when both members of the pair were very close in size or one or both lobsters were missing one or both claws. Field observations indicated that laboratory stresses may be responsible for the clear-cut relationship between dominance and shelter possession. When, in the laboratory, size graded groups were allowed to burrow under a long flat board the total number of lobsters occupying shelters decreased with time and the dominant animal controlled most of the burrow sites.

8B. Cartography

AD-A071 124/2GA MF **A01**
Rochester Univ NY Dept of Computer Science
STRIP TREES: A Hierarchical Representation for Map Features.
Technical rept.,
Dana H. Ballard. Dec 78, 40p Rept no. TR-32
Contract N00014-78-C-0164
Availability: Microfiche copies only.

Descriptors: Data bases, Maps, Hierarchies, Aerial photographs, Image processing, Lines(Geometry), Computer aided design.
Identifiers: *Computer aided mapping, Trees(Mathematics).

There is increasing interest in map features such as points, lines and regions both as a pictoral data base for resource management and as an aid to identifying objects in aerial images. Owing to the very large amount of data involved, and the need to perform operations on this data efficiently, the representation of such features is a crucial issue. We describe a hierarchical representation of map features that consists of binary trees with a special datum at each node. This datum is called a strip and the tree that contains such data is called a strip tree. Lower levels in the tree corresponds to finer resolution representations of the map feature. The strip tree structure is a direct consequence of using the method for digitizing lines given by Duda & Hart, 1973; Turner, 1974; Douglas & Peucker, 1973 and retaining all intermediate steps. This representation has several desirable properties. For features which are well-behaved, calculations such as point-membership and intersection can be resolved in 0(logn) where n is the number of feature points. The map features can be efficiently encoded and displayed at various resolutions.

8C. Dynamic Oceanography

AD-A070 554/1GA PC **A02**/MF **A01**
Coastal Engineering Research Center Fort Belvoir VA
The Effects of the 19 December 1977 Coastal Storm on Beaches in North Carolina and New Jersey,
William A. Birkemeier. 1978, 11p Rept no. CERC-REPRINT-79-2
Pub. in Shore and Beach, p7-15 Jan 79.

Descriptors: *Beach erosion, *Storms, Ocean waves, Ocean tides, Surf, *North Carolina, *New Jersey, Sediment transport, Reprints.
Identifiers: *Coasts.

No abstract available.

PB-298 726/1GA PC **A14**/MF **A01**
National Ocean Survey, Rockville, MD.
Tide Tables 1980 High and Low Water Predictions. East Coast of North and South America Including Greenland.
1979, 302p* NOAA-79070301
See also Tables 1979, PB-282 467.

Descriptors: *Ocean tides, *Atlantic Ocean, Predictions, North America, South America, Greenland, Coasts, Ephemerides, Tables(Data).
Identifiers: Moonrise, Moonset, Sunrise, Sunset.

This edition of the Tide Tables, East Coast of North and South America contains full daily predictions for 38 reference ports and differences and other constants for about 2,000 stations in North America, South America, and Greenland. It also contains a table for obtaining the approximate height of the tide at any time, a table of local mean time of sunrise and sunset for every 5th day of the year for different latitudes, a table for the reduction of local mean time to standard time, a table of moonrise and moonset for 8 places, a table of the Greenwich mean time of the Moon's phases, apogee, perigee, greatest north and south and zero declination, and the time of the solar equinoxes and solstices, and a glossary of terms.

PB-298 966/3GA PC **A03**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Marine Ecosystems Analysis Program Office.
Numerical Modeling in the Strait of Juan de Fuca and Puget Sound.
Technical memo. for FY-78,
C. H. Pease, R. J. Stewart, and J. E. Overland.
Feb 79, 38p NOAA-TM-ERL-MESA-38, NOAA-79062801

Descriptors: *Ocean currents, *Puget Sound, *Juan de Fuca Strait, *Oil pollution, Air water interactions, Ocean tides, Meteorology, Estuaries, Trajectories, Mathematical models, Washington(State).
Identifiers: Oil spills, Path of pollutants, MESA program, MESA Puget Sound Project.

This report summarizes and interprets tidal current and oil spill trajectory predictions obtained from a computer model of the Strait of Juan de Fuca and regional wind fields derived from a computer model of the entire Puget Basin. The meteorology of the Puget Sound Basin is discussed with respect to three dominant weather patterns which were subsequently used to run the regional meteorological model. These model results are incorporated into oil spill trajectory calculations as large scale wind fields over the Straits which are sequentially keyed by baric types for any given modeling period. A sea breeze condition was also considered and is described in the trajectory modeling section. The oceanography of the Strait of Juan de Fuca region is presented as a discussion of the dominant features, tidal and estuarine flow components, and some possible deviations from these main elements. The tide subroutines constructed for the trajectory model are based on empirical data from NOS tidal current stations and are inline functions to the trajectory model. The principal product of the model was a series of simulated oil spill trajectories.

PB-298 987/9GA PC **A10**/MF **A01**
Hawaii Univ., Honolulu. Dept. of Electrical Engineering.
An Engineering Feasibility Study of an Ionospheric Technique to Improve Tsunami Warning Systems.
Rept. no. 2,
Kazutoshi Najita. 30 Sep 76, 210p NSF/RA-761702
Grants NSF-GI-34973, NSF-ATA72-03505

Descriptors: *Tsunamis, *Warning systems, *Ionospheric disturbance, Doppler effect, Rayleigh waves, Elastic waves, Ionosphere, Earthquakes, Computer programs, Fortran, Ray tracing.
Identifiers: Infrasonic radiation, Fortran 4 programming language.

This is the second report to the National Science Foundation on a research program designed to establish the feasibility of a tsunami warning system based on data obtained using an HF Doppler technique which measures changes in the upper atmosphere caused by fast Rayleigh waves from a tsunamigenic earthquake. This report describes the studies carried out to better interpret the ionospheric Doppler recording. The study covers the acoustic waves from the launch point to ionospheric heights through the atmosphere. It reports on the different aspects of determining the accuracy to which one could determine the propagation path and the travel time for these long period acoustic waves. It describes the work carried out thus far on the determination of the initial phases of the Rayleigh waves and points out the extreme accuracy required of the recording and analysis of the data.

PB-299 047/1GA PC **A03**/MF **A01**
National Oceanic and Atmospheric Administration, Seattle, WA. Pacific Marine Environmental Lab.
Recovery Record for Surface Drift Cards Released in the Puget Sound-Strait of Juan de Fuca System during Calendar Years 1976-1977.
Technical memo.,
D. J. Pashinski, and R. L. Charnell. Jun 79, 35p
NOAA-TR-ERL-PMEL-14, NOAA-79072402

Descriptors: *Ocean currents, *Puget Sound, *Juan de Fuca Strait, Ocean surface, Wind(Meteorology), Air water interactions, Estuaries, Washington(State), Statistical analysis.
Identifiers: Oil pollution, Path of pollutants.

The Puget Sound Drift Program released 5000 polypropylene drift cards in the Puget Sound and Strait of Juan de Fuca system between April 1976 and July 1977. By November 1977, 1,470 replies had been processed. These replies were analyzed statistically as well as descriptively. Winds with time scales varying from hours to weeks, as a function of system spatial constraints, have been found to be the dominant factor influencing the grounding of drifters. The migration of the drifters was consistent with a mean estuarine flow of 6 km per day with a superimposed dispersive component of 7 km per day. The average time a drifter was waterborne, likewise a function of system spatial constraints, ranged from less than 1 day in Puget Sound to greater than 3 days in the Strait of Juan de Fuca.

PB-299 104/0GA PC **A02**
National Environmental Satellite Service, Boulder, CO.
Satellite Observations of the Influence of Bottom Topography on the Seaward Deflection of the Gulf Stream off Charleston, South Carolina,
Richard V. Legeckis. 14 Mar 78, 17p NOAA-79072301
Pub. in Jnl. of Physical Oceanography, v9 n3 p483-497 May 79.

Descriptors: *Ocean currents, *Submarine topography, *Ocean bottom, Ocean surface, Ocean temperature, Infrared photography, Scientific satellites, North Atlantic Ocean.
Identifiers: *Gulf Stream, NOAA-5 satellite, Reprints.

High-resolution thermal infrared data from the NOAA polar orbiting satellites are studied for the

Gulf Stream between Florida and Cape Hatteras from the fall of 1974 to the spring of 1977. The sea surface temperature boundaries of the current are detectable in infrared images from fall to spring of each year. Seasonal changes in air-sea temperatures appear to limit the detection of the surface temperature gradients during the warmer months. A persistent seaward deflection of the western boundary is found southeastward of Charleston, South Carolina, in the vicinity of a bulge in the continental slope. Downstream from the initial deflection, the western boundary is often wavelike. Several distinct and repeatable wave patterns are described.

8D. Geochemistry

AD-A070 685/3GA Not available NTIS
Rhode Island Univ Kingston Graduate School of Oceanography
Determination of Organic Carbon in Marine Sediments by Persulfate Oxidation.
Gary L. Mills, and James G. Quinn. 9 May 78, 8p
Contract N00014-76-C-0226
Availability: Pub. in Chemical Geology, v25 p155-162 1979. (No copies furnished by DDC).

Descriptors: *Geochemistry, *Sediments, Carbon, Carbon dioxide, Oxidation reduction reactions, Ocean bottom soils, Infrared detection, Sampling, Reprints.

No abstract available.

8E. Geodesy

AD-A070 873/5GA PC **A02**/MF **A01**
Belgian Royal Observatory Uccle
A Trans-World Tidal Gravity Profile,
B. Ducarme, and P. Melchior. 15 Apr 77, 22p
MEDEDELINGEN-A-48, GEOFYSICA-132, AFGL-TR-79-0127
Grant AFOSR-78-3521
Pub. in Physics of the Earth and Planetary Interiors, v16 n3 p257-276 1978.

Descriptors: Tides, Gravity, Profiles, Global, Amplitude, Phase studies, Reprints.
Identifiers: *Earth tides.

No abstract available.

N79-28644/9GA PC **A03**/MF **A01**
Ohio State Univ., Columbus. Dept. of Geodetic Science.
Global Accuracy Estimates of Point and Mean Undulation Differences Obtained from Gravity Disturbances, Gravity Anomalies and Potential Coefficients.
C. Jekeli. 1979, 46p NASA-CR-158836, REPT-288
Contract NGR-36-008-161

Descriptors: *Geoids, Gravity anomalies, *Ocean surface, Truncation errors, Wave propagation, Approximation, Data correlation, Error analysis, Estimating, Geodesy, Graphs (Charts), Potential theory, Topography.

For abstract, see STAR 1719

N79-28646/4GA PC **A06**/MF **A01**
Ohio State Univ., Columbus. Dept. of Geodetic Science.
Satellite Triangulation in Europe from WEST and ISAGEX Data.
A. Leick, and M. Arur. Nov 75, 116p NASA-CR-158835, REPT-232
Contract NGR-36-008-093

Descriptors: Computer programs, Data processing, *Geodesy, *Satellite observation, Transformations (Mathematics), Triangulation, Cartesian coordinates, Fortran, Geodetic coordinates, Tables (Data).

For abstract, see STAR 1719

8G. Geology and Mineralogy

LBL-8280 PC **A08**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Preliminary Report on Geophysical and Mechanical Borehole Measurements at Stripa.
P. Nelson, B. Paulsson, R. Rachiele, L. Andersson, and T. Schrauf. May 79, 167p SAC-16
Contract W-7405-ENG-48

Descriptors: *Granites, Boreholes, Chemical composition, Gamma logging, Geophysical surveys, Physical properties, Sonic logging, Sweden, Thorium, Uranium, Well logging.
Identifiers: ERDA/580300, ERDA/052002.

For abstract, see ERA citation 04:043864.

N79-28648/0GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
Evaluation and Modeling of the Topographic Effect on the Spectral Response from Nadir Pointing Sensors.
B. N. Holben, and C. O. Justice. Jun 79, 24p
NASA-TM-80305
Subm-Submitted for Publication.

Descriptors: Mathematical models, Radiometers, Remote sensors, Spectrum analysis, Topography, Azimuth, Evaluation, Graphs (Charts), Landsat satellites, Radiance, Spectral correlation, Tables (Data), *Terrain analysis, Variations.
Identifiers: Remote sensing.

For abstract, see STAR 1719

ORNL/TM-6809 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Thermal Conductivity of Rock Salt from Louisiana Salt Domes.
M. T. Morgan. Jun 79, 21p
Contract W-7405-ENG-26

Descriptors: *Salt deposits, Density, Experimental data, High temperature, Isolated values, Louisiana, Medium temperature, Temperature dependence, Thermal conductivity.
Identifiers: ERDA/580300, ERDA/052002, *Rock salt.

For abstract, see ERA citation 04:045490.

TID-28921 PC **A13**/MF **A01**
Fenix and Scisson, Inc., Tulsa, OK.
Geologic Study Southern Louisiana Salt Domes. Volume III.
294p
Contract EM-77-C-01-5048

Descriptors: Louisiana, *Salt deposits, Brines, Geology, Seismicity, Waste disposal.
Identifiers: ERDA/580100, Southern Region(Louisiana).

For abstract, see ERA citation 04:028172.

8H. Hydrology and Limnology

AD-A070 684/6GA PC **A02**/MF **A01**
Rosenstiel School of Marine and Atmospheric Science Miami FL
The Use and Misuse of Pure Water PVT Properties for Lake Waters,
Chen-Tung Chen, and Frank J. Millero. 22 Nov 76, 3p Rept no. 2105
Contract N00014-75-C-0173
Pub. in Nature, v266 n5604 p707-708, 21 Apr 77.

Descriptors: *Lakes, Purity, Pressure, Measurement, Temperature, Density, Volume, Reprints.
Identifiers: *Water pollution, Density(Mass/Volume), Physical properties.

No abstract available.

LA-7455-MS PC **A05**/MF **A01**
Los Alamos Scientific Lab., NM.
Sorption--Desorption Studies on Argillite. I. Initial Studies of Strontium, Technetium, Cesium, Barium, Cerium, and Europium.
B. R. Erdal, R. D. Aguilar, B. P. Bayhurst, P. Q. Oliver, and K. Wolfsberg. Mar 79, 76p
Contract W-7405-ENG-36

Descriptors: *Argillite, Barium, Cerium, Cesium, Europium, Strontium, Technetium, Adsorption, Desorption, Experimental data, Isolated values, Sorptive properties.
Identifiers: ERDA/580100, ERDA/052002, ERDA/510301, Ground water, Tracer studies.

For abstract, see ERA citation 04:045472.

LBL-8285 PC **A07**/MF **A01**
Waterloo Univ. (Ontario). Dept. of Earth Sciences.
Geochemistry and Isotope Hydrology of Groundwaters in the Stripa Granite: Results and Preliminary Interpretation.
P. Fritz, J. F. Barker, and J. E. Gale. Apr 79, 141p SAC-12
Contract W-7405-ENG-48

Descriptors: *Granites, Carbon 13, Carbon 14, Chlorides, Deuterium, Geochemistry, Geologic deposits, *Ground water, Hydrology, Oxygen 18, pH value, Radioactive waste disposal, Sweden, Underground disposal.
Identifiers: ERDA/052002, ERDA/580400, *Stripa mine, Isotopes, Isotope ratio.

For abstract, see ERA citation 04:044385.

PB-298 422/7GA PC **A05**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Hall and Eastern Briscoe Counties, Texas,
B. P. Popkin. Apr 73, 92p TDWR/R-167
Prepared in cooperation with Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Hall County(Texas), *Briscoe County(Texas).

Hall and eastern Briscoe Counties are in the Southeastern part of the Texas Panhandle. Nearly all the water used in the area is from wells and springs. Most of the water for irrigation and all water for public supply in Hall County is from alluvial deposits. In eastern Briscoe County, most of the water for irrigation and public supply is pumped from aquifers in the Ochoa Series of Permian age. The total ground-water withdrawl in 1968 is estimated at 28,700 acre-feet. About 65 percent of this amount was from the alluvial deposits and nearly 20 percent was from the Ochoa Series. Few records are available from which definite trends of water levels can be determined. Water levels in most of the irrigation areas declined during the period 1960-69 from less than 1.0 to 29.0 feet. Water from the Permian units generally is of the calcium sulfate type and has a dissolved-solids content that ranges from less than 1,000 to more than 10,000 milligrams per liter. The quality of water from the Quaternary alluvium and terrace deposits varies widely, depending upon the source of recharge. Where the alluvium is recharged from Permian rocks, the water usually contains calcium and sulfate as the major constituents. Where the recharge is mostly from direct infiltration of rainfall, the water contains calcium and bicarbonate as the major constituents.

PB-298 429/2GA PC **A05**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Rains and Van Zandt Counties, Texas,
D. E. White. Apr 73, 90p TDWR/R-169
Prepared in cooperation with Geological Survey, Reston, VA.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Rains County(Texas), *Van Zandt County(Texas).

Rains and Van Zandt Counties in northeast Texas have abundant water resources and comparatively little water demand. The water is derived from the heavy precipitation (about 43 inches annually), which fills the numerous lakes and reservoirs, and recharges the fresh-water aquifers. One of the aquifers in the area, the Carrizo-Wilcox, has been appreciably developed. During 1969, this aquifer supplied a reported 1,500 acre-feet of water for municipal supply, industrial use, and rural water

systems in the two counties. The Carrizo-Wilcox aquifer contains an estimated 50 million acre-feet of fresh to slightly saline water in storage. About 10 percent of this amount, or 5 million acre-feet, is thought to be available to wells. In addition to the water in storage, the Carrizo-Wilcox aquifer annually receives an estimated 5,000 acre-feet of effective recharge from precipitation. Yields of wells tapping the Carrizo-Wilcox aquifer are reported to range from less than 5 to as much as 600 gpm (gallons per minute). Most of the municipal and industrial wells are equipped to pump at rates of 100 to 250 gpm. Yields exceeding 250 gpm normally cannot be sustained during extended periods of pumping. A second aquifer, the Queen Sand, in southeastern Van Zandt County, which is currently tapped solely for rural domestic and livestock supply, probably is capable of yielding as much as 150 gpm of fresh water to properly constructed wells.

PB-298 430/0GA PC **A06**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Blanco County, Texas,
C. R. Follett. Aug 73, 104p TDWR/R-174
Prepared in cooperation with Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Blanco County(Texas).

Ground water in Blanco County is used primarily for rural-domestic and stock needs, and to a lesser extent for municipal supply and irrigation. Use of ground water for all purposes in 1968 was about 1,400 acre-feet or 1.2 mgd (million gallons per day). Of this amount, about 1,300 acre-feet was used for rural-domestic and stock needs. Only 15 acre-feet of ground water was used for public supply. About 26,000 acre-feet per year of fresh to slightly saline water is available for ground-water development from all of the aquifers on a long-term basis. This quantity is 19 times the ground-water usage for all purpose in the county in 1968. The present yields of wells range from less than 1 to about 600 gpm (gallons per minute). Yields of 200 to 600 gpm from wells are unusual because the potential yield of wells drilled in most places in the county is from 10 to 25 gpm. Ground water of good to fair quality for public and domestic supplies is available in most of the county, and much of the water meets the standards recommended by the U.S. Public Health Service. Hardness probably is the most objectionable property.

PB-298 433/4GA PC **A06**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Gonzales County, Texas,
G. H. Shafer. Nov 65, 102p TDWR/R-4
Prepared in cooperation with Geological Survey, Reston, VA., Gonzales County Commissioner's Court, TX., and Guadalupe-Blanco River Authority, TX.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Gonzales County(Texas).

The principal water-bearing formation in the county is the Carrizo Sand, which yields moderate to large quantities of fresh to slightly saline water throughout a large part of its subsurface extent. Small to moderate quantities of such water are obtained from the Wilcox Group, the Queen City Sand, and the Sparta Sand. Other formations yield only small quantities of water for domestic and livestock use. All the domestic and public supplies, except for the city of Gonzales, and a large part of the livestock supplies are obtained from ground-water sources. About 10 mgd (million gallons per day) of ground water was pumped in 1962; 0.68 mgd was for municipal supply, and 7.3 mgd was for miscellaneous purposes. Only about 0.1 mgd (120 acre-feet) of water was pumped for irrigation in 1962. Of the ground water pumped in 1962, 8.0 mgd was from the Carrizo Sand. The yields of wells in Gonzales County ranged from a few gallons a minute to as much as 1,200 gpm (gallons per minute), but yields as large as 2,000 gpm can be expected from properly constructed wells screened in that part of the Carrizo that contains fresh to slightly saline water in most of the northeastern and southeastern parts of the county.

PB-298 437/5GA PC **A09**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Gaines County, Texas,
P. L. Rettman, and E. R. Leggat. Feb 66, 194p TDWR/R-15
Prepared by Geological Survey, Reston, VA., and Gaines County Commissioner's Court, TX.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Gaines County(Texas).

Ground water in Gaines County is obtained from three aquifers, the principal one being in the Ogallala Formation. In 1963, about 193,000 acre-feet of ground water was pumped, nearly all of which was from the Ogallala. About 182,000 acre-feet was used for irrigation. Small quantities were pumped from the Triassic and Cretaceous rocks, principally for irrigation and waterflooding. Because of the low recharge rate, the water in storage in the Ogallala Formation is, in general, being depleted, even though water levels have risen in some areas. Since pumping for irrigation began in 1946, water levels in wells have declined in the western part of the county and have risen in the eastern part. The maximum decline was 35.7 feet and the maximum rise was 28.3 feet. The quantity of ground water estimated to be in storage in the county in 1964 was 8.5 million acre-feet, which would be enough to sustain nearly 50 years of pumping at the 1963 rate of pumping.

PB-298 557/0GA PC **A04**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Hardeman County, Texas.
M. L. Maderak. Nov 72, 56p TDWR/R-161
Prepared by the Geological Survey, Reston, VA.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Hardeman County(Texas).

The Blaine Formation of Permian age and the alluvial terrace deposits of Quaternary age are the most important sources of large quantities of ground water in Hardeman County. In a broad sense, ground water moves eastward from Childress and Cottle Counties, but in detail the water moves from the uplands to the major rivers and streams. The quantity of water moving through the alluvium in the vicinity of Chillicothe is estimated at 2,600 acre-feet per year, which is equivalent to about 1 inch or 5 percent of the average annual precipitation. Recharge to the Blaine Formation is estimated to be about 17,000 acre-feet per year, assuming that 5 percent of the average annual precipitation on the outcrop area of the aquifer percolates to the water table. Water levels in most wells in the Blaine Formation during the period 1953-69 showed a net decline of 10 to 20 feet; water levels in wells in the alluvium near Chillicothe during the period 1960-69 had an average decline of 3.6 feet, or less than 0.5 foot per year. Withdrawal of ground water for municipal and domestic supply, livestock use, industrial use, and irrigation is estimated at 11,500 acre-feet in 1968.

PB-298 626/3GA PC **A07**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Nueces and San Patricio Counties, Texas,
George H. Shafer. May 68, 144p TDWR/R-73
Prepared by Geological Survey, Reston, VA., and San Patricio Municipal Water District, TX.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Nueces County(Texas), *San Patricio County(Texas).

The principal water-bearing units in Nueces and San Patricio Counties are the Goliad Sand, Lissie Formation, and Beaumont Clay (the Gulf Coast aquifer). The units crop out in belts that roughly parallel the coast and dip to the southeast at an angle greater than the slope of the land surface. Ground water in the two counties moves southeastward from the areas of recharge to areas of discharge. Several communities use ground water for public supply, but the largest public supplies are obtained from the Nueces River. During 1964, about 17,500 acre-feet (15.6 million gallons per day) of ground water was pumped for all purposes in the two counties. About 2,600 acre-feet (2.3 mgd) was for public supply, 9,200 acre-feet (8.2 mgd) for irrigation, 2,300 acre-feet (2.1 mgd) for industrial use, and 3,400 acre-feet (3.0 mgd) for domestic and livestock use.

PB-298 639/6GA PC **A05**/MF **A01**
Nevada Univ. System, Reno. Water Resources Center.
Hydrologic Drought in the Humboldt Basin, Nevada.
Hydrology and water resources technical rept., Vulli L. Gupta, and Richard J. Pautsch. Jun 79, 94p H-W-35, PUB-42035, W79-08604, OWRT-A-086-NEV(2)
Contract DI-14-31-0001-8030

Descriptors: *Droughts, *Humboldt River Basin, Hydrology, Precipitation(Meteorology), Stream flow, Water supply, Statistical analysis, Nevada.

In spite of the lack of a unified definition of drought among the community of hydrologists, meteorologists, and agronomists, the impact of drought is felt in the water supply, irrigated agriculture, and stream water quality sectors. A study was undertaken in the Humboldt Basin wherein precipitation and stream-flow were analyzed for statistical properties such as randomness, cyclical behavior, and wet and dry period clustering effects. Results include estimates of extreme values and the associated return periods; a limited scale attempt was made to assess the impact of such extremes on the agricultural production along the Humboldt River.

PB-298 683/4GA PC **A07**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Bastrop County, Texas,
C. R. Follett. Mar 70, 150p TDWR/R-109
Prepared by Geological Survey, Reston, VA.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Bastrop County(Texas).

The principal formations in Bastrop County that yield or are capable of yielding moderate or large quantities of water to wells are, in order of decreasing yields, the Wilcox Group, Carrizo Sand, Queen City Sand, and Sparta Sand. The Reklaw, Cook Mountain, and Yegua Formations and the alluvium along the Colorado River are less prolific. The Carrizo and Sparta are almost all sand; the Wilcox and the Queen City are about 40 percent sand and 60 percent sandy clay, clay, or shale. The Carrizo Sand and the underlying Wilcox Group are connected hydrologically and function as a single aquifer. During the 5-year period from 1962 through 1966, 35 percent of the ground water used was for municipal supply, 35 percent for irrigation, 4 percent for industrial supply, and 26 percent for domestic and livestock supply. The use of ground water is gradually increasing, but the total of 3.7 mgd (million gallons per day) or 4,100 acre-feet per year used in 1966 is small compared to the quantity available. About 100 million acre-feet of fresh to slightly saline water is in transient storage in the principal aquifers, but only a fraction of this water is economically recoverable by known methods at present costs.

PB-298 709/7GA PC **A09**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Matagorda County, Texas,
Weldon W. Hammond. Mar 69, 183p TDWR/R-91
Prepared by Geological Survey, Reston, VA., Lower Colorado River Authority, TX., and Matagorda County, TX.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Matagorda County(Texas).

The surface of Matagorda County is largely a depositional plain of the Beaumont Formation which was deposited by streams as a series of coalescing alluvial and deltaic plains. The depositional period occurred near the close of the last ice age, during a rise in sea level. The geomorphology of the county is typical of a very slightly eroded coastal plain, having low relief, abandoned river valleys, marsh areas, and offshore barrier bars. Ground water in Matagorda County occurs in several formations of differing ages but similar lithology. The formations are composed of interfingering beds and lenses of silt, clay, sand, and gravel, and function as a single water-bearing unit termed the Gulf Coast aquifer. Ground water moves through the aquifer at 10 to 20 feet per year from areas of recharge in and north of the county to areas of discharge in the Gulf of Mexico.

PB-298 710/5GA PC **A04**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Wheeler and Eastern Gray Counties, Texas,
M. L. Maderak. May 73, 73p TDWR/R-170
Prepared by Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Wheeler County(Texas), *Gray County(Texas).

The Ogallala Formation, the principal source of fresh ground water in the area, supplies nearly all the water for municipal supply and slightly more than half of the water used for irrigation. The Blaine Formation and the Whitehorse Group are sources of water principally for irrigation. Groundwater pumpage in 1966 was about 10,200 acre-feet, an increase of nearly three times the amount pumped in 1955. Of the pumpage in 1966, 6,900 acre-feet was for irrigation, most of which was in Wheeler County. Available water-level records are inadequate to determine a definite trend in the water levels, but the withdrawals of ground water since at least 1955 apparently have not caused a serious decline in the water table or in the amount of water in storage. The Ogallala Formation yields water that generally contains less than 500 mg/l (milligrams per liter) dissolved solids and is the calcium bicarbonate type.

PB-298 712/1GA PC **A05**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Gregg and Upshur Counties, Texas,
Matthew E. Broom. Oct 69, 87p TDWR/R-101
Prepared by Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Gregg County(Texas), *Upshur County(Texas).

Gregg and Upshur Counties, in northeast Texas, are underlain by two aquifers that are capable of sustaining additional development. The aquifers consist of the Wilcox Group and Carrizo Sand (Carrizo-Wilcox aquifer) and the Queen City Sand. The Carrizo-Wilcox aquifer, the most productive of the two aquifers, underlies all of the 2-county area at increasingly greater depths toward the trough (East Texas Embayment) that trends northeasterly through the east-central part of Upshur County. Of the total pumpage of 3.02 mgd (million galons per day) in 1966, 2.84 mgd was from the Carrizo-Wilcox aquifer. At the 1966 hydraulic gradient (8 feet per mile), about 12,000 acre-feet per year (10.9 mgd) was being transmitted through this aquifer. The amount that is perennially available is not known, but it is probably at least two times that pumped in 1966. In addition, 45 million acre-feet of fresh to slightly saline water is in transient storage in the Carrizo-Wilcox aquifer; however, much of this lies at a depth of more than 400 feet. The water in the Carrizo-Wilcox generally is soft, but the high chloride content in parts of Upshur and most of Gregg County may limit development of the ground-water supplies in the aquifer, particularly for municipal and domestic uses.

PB-298 713/9GA PC **A05**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Cass and Marion Counties, Texas,
Mathew E. Broom. Oct 71, 78p TDWR/R-135
Prepared by Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Cass County(Texas), *Marion County(Texas).

Cass and Marion Counties, an area of 1,325 square miles in northeast Texas, are underlain by the Cypress aquifer which is composed of the Wilcox Group, Carrizo Sand, Reklaw Formation, and Queen City Sand, all of Eocene age. These geologic units are for the most part hydraulically interconnected and generally function as a single aquifer. As a result of ground-water development, water levels in the artesian section of the aquifer have declined as much as 109 feet since 1964. Three areas in Cass and Marion Counties have been significantly affected by pumping, but elsewhere in the report area, water levels show no appreciable change. Pumpage of ground water in 1967 was 3.6 mgd (million gallons per day) or about 4,000 acre-feet. The Cypress aquifer is capable of sustaining additional development. About 8.5 mgd of ground water is currently moving through the aquifer, and probably an equal or greater quantity of potential recharge is being rejected to streams as base flow. Current pumpage probably could be increased to more than four times the present rate without exceeding the rate of ground-water replenishment or depleting the supply. About 90 million acre-feet of fresh to slightly saline water is stored in the Cypress aquifer.

PB-298 714/7GA PC **A09**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Fort Bend County, Texas,
J. B. Wesselman. Aug 72, 187p TDWR/R-155
Prepared by Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Fort Bend County(Texas).

Fresh water is available in Fort Bend County only from the Chicot and Evangeline aquifers of Tertiary and Quaternary age. The Jasper aquifer, of Tertiary age, which is the deepest hydrologic unit, contains some slightly saline water in the northwestern part of the county. The Evangeline aquifer contains fresh water at depths of more than 2,200 feet below mean sea level. The thickness of the water-bearing sands ranges from 100 to 600 feet and averages about 300 feet. The average coefficient of permeability is probably about 250 gpd (gallons per day) per square foot. The thickness of sands containing fresh water in the Chicot aquifer ranges from 200 to 400 feet and averages about 350 feet. The average coefficient of permeability is estimated to be about 645 gpd per square foot. Most of the ground water pumped in the county comes from the Chicot aquifer. The total thickness of sands containing fresh water in Fort Bend County averages about 650 feet. Assuming a porosity of 30 percent, about 120 million acre-feet of fresh water is in storage in the aquifers, and about 45 million acre-feet is in storage in the upper 500 feet of sediments.

PB-298 724/6GA PC **A07**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Sabine and San Augustine Counties, Texas,
Robert B. Anders. Jan 67, 131p TDWR/R-37
Prepared by Geological Survey, Reston, VA, and Sabine River Authority of Texas, Orange.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Sabine County(Texas), *San Augustine County(Texas).

Rocks underlying the area are composed of sand, silt, and clay, and contain lesser amounts of glauconite and lignite. The important aquifers are in the Carrizo Sand and Wilcox Group, the Sparta Sand, and the Yegua Formation. Precipitation on the outcrops of the aquifers is the primary source of recharge. The aquifers are full and about 46 mgd (million gallons per day) is presently moving downdip through the important aquifers. Throughout the area about 1.3 mgd was discharge in 1964 from municipal, livestock, rural domestic, industrial, and uncontrolled flowing wells.

PB-298 728/7GA PC **A06**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Collingsworth County, Texas,
James T. Smith. Jul 70, 121p TDWR/R-119
Prepared by Geological Survey, TX.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Collingsworth County(Texas).

The principal aquifers of the County are the Blaine Formation of Permian age and the alluvial plain, terrace, and channel deposits of Quaternary age. Aquifers of minor importance are the Flowerpot Shale, Dog Creek Shale, and Whitehorse Group of Permian age; and the Ogallala Formation of Tertiary age. The Blaine Formation yields small to large quantities of saline water to wells and is capable, in places where solution cavities are interconnected, of yielding more than 1,000 gallons per minute. Although the water is of poor quality, the Blaine is the major source of irrigation water in the county. The Quaternary alluvium yields small to large quantities of water that is generally low in dissolved solids, and is the major source of water for municipal supply. Water levels in the aquifers have remained generally steady since about 1938, except in a few areas of concentrated pumpage for irrigation. The major water quality problems in Collingsworth County are the concentrations of dissolved solids, sulfate, chloride, and sodium. No evidence was found of ground-water pollution from oil-field brines.

PB-298 729/5GA PC **A06**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Polk County, Texas,
George R. Tarver. Aug 68, 122p TDWR/R-82
Prepared by Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Polk County(Texas).

The principal aquifers of Polk County--the Catahoula Sandstone, Jasper aquifer, and Evangeline

aquifer--contain fresh to slightly saline water to a depth of as much as 1,800 feet below sea level. In the southeastern part of the county where the base of fresh to slightly saline water is deepest, the sand that contains this water has a maximum thickness of about 800 feet. The southern two-thirds of the county, which is underlain by the principal aquifers, can supply large quantities of fresh to slightly saline water. Large supplies of fresh water are not available in the northern one-third of the county. In the northernmost part of this area, which is underlain by the Yegua Formation and Jackson Group, even small supplies are difficult to obtain. The ground-water resources of Polk County are practically untapped. Aquifers underlying the county contain an estimated 55 million acre-feet of fresh to slightly saline water in transient storage. Of this amount, about 10 million acre-feet is available to wells if the aquifers are dewatered to 400 feet below land surface.

PB-298 733/7GA PC **A08**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Montgomery County, Texas,
Barney P. Popkin. Nov 71, 153p TDWR/R-136
Prepared by Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Montgomery County(Texas).

Ground water in Montgomery County is contained in sands of the Catahoula Sandstone, lower part of the Jasper aquifer, upper part of the Jasper aquifer, Burkeville aquiclude, Evangeline aquifer, and Chicot aquifer. The Chicot, Evangeline, and upper part of the Jasper generally contain fresh water throughout the county. The Catahoula Sandstone and lower part of the Jasper contain fresh and slightly saline water in the northern and central parts of the county. The Evangeline transmits about 10 mgd (million gallons per day) and the upper part of the Jasper transmits about 3.5 mgd. The quality of water in the aquifers is good and can be used for most purposes. The ground-water resources of the county are practically untapped. In 1966, about 6.2 mgd of ground water was used for all purposes. The principal uses, about 2.6 mgd, were for rural domestic and livestock supplies. Almost all of the water was obtained from the Evangeline and upper part of the Jasper. About 80 million acre-feet of fresh ground water is in storage in Montgomery County. However, most of this water cannot be economically produced. Calculations based on the transmission capacity of the Evangeline and upper part of the Jasper indicate that about 65 mgd could be obtained with pumping levels not exceeding 400 feet along an assumed line of discharge in the latitude of Conroe.

PB-298 737/8GA PC **A08**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Liberty County, Texas,
R. B. Anders, G. D. McAdoo, and W. H. Alexander. Apr 68, 155p TDWR/R-72
Prepared by Geological Survey, Austin, TX.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Liberty County(Texas).

The aquifers in Liberty County contain large quantities of fresh water that extend to depths as great as 1,800 feet below sea level. The development of the county's ground-water resources resulted primarily from the increased use of ground water for rice irrigation. In 1965, and estimated 51.2 mgd (million gallons per day) of ground water was used in the county: 48.9 mgd (54,814 acre-feet), about 95 percent of the total, was used to irrigate about 18,400 acres of rice; and 1.6 mgd, about 3 percent of the total, was used for public supply. During the same year, an estimated 55,000 acre-feet of water was pumped from the Trinity River for the irrigation of an additional 18,400 acres of rice. Ground-water use can be increased to about 200 mgd if most of the development is restricted to the northern and central parts of the county. This estimate is based on a preliminary appraisal of the ground-water resources and is subject to revision as more data become available. However, this estimate is in agreement with data from the adjacent Houston district, where under similar ground-water conditions, about 400 mgd is being used.

PB-298 748/5GA PC **A09**/MF **A01**
Texas Water Development Board, Austin.
Ground-Water Resources of Chambers and Jefferson Counties, Texas,
J. B. Wesselman. Aug 71, 189p TDWR/R-133
Prepared by Geological Survey, Reston, VA. and Lamar Univ., Beaumont, TX. Dept. of Geology.Color illustrations reproduced in black and white.

Descriptors: *Water resources, *Ground water, Aquifers, Water wells, Drawdown, Water storage, Water quality, Water table, Ground water recharge, Water analysis, Hydrogeology, Water supply, Texas.
Identifiers: *Water yield, *Water quality data, *Chambers County(Texas), *Jefferson County(Texas).

The hydrologic units of Chambers and Jefferson Counties, the Chicot and Evangeline aquifers and the Burkeville aquiclude, are composed of gravel, sand, silt, and clay of Miocene, Pliocene, Pleistocene, and Holocene age. Only small quantities of fresh ground water, less than 1,000 mg/l (milligrams per liter) dissolved solids, are available in Chambers and Jefferson Counties, and these supplies are fairly well developed. In 1965, approximately 18.6 mgd (million gallons per day) of ground water was used in the report area. Of this amount 10 mgd was fresh water produced from wells in adjacent Hardin and Orange Counties. Total pumpage of fresh water in Chambers and Jefferson Counties was approximately 6.1 mgd. About 2.5 mgd was slightly or moderately saline water. Industrial use of ground water was approximately 9 mgd, of which 4 mgd was imported. Municipal use of ground water was approximately 8 mgd, of which 6 mgd was imported from Hardin County by the city of Beaumont. Irrigation use in 1965 was approximately 1.5 mgd. Use of ground water for irrigation will remain small because most of the available water is too saline.

PB-298 888/9GA PC **A03**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
Watershed Management in the Central and Southern Rocky Mountains: A Summary of the Status of Our Knowledge by Vegetation Types.
Forest Service research paper (Final),
Charles F. Leaf. Mar 75, 33p FSRP-RM-142

Descriptors: *Hydrology, *Forestry, *Watersheds, Snow, Land use, Yield, Water supply, Rocky Mountains, Pine trees, Black Hills, Colorado.

The report summarizes a series of comprehensive reports on watershed management in five major vegetation zones: (1) The coniferous forest subalpine zone; (2) the Front Range ponderosa pine zone; (3) the Black Hills ponderosa pine zone; (4) the alpine zone; and (5) the big sagebrush zone. The study includes what is known about the hydrology of these lands, what hydrologic principles are important for multiresource management, and what additional information is needed for each vegetation type.

PNL-2894 PC **A10**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Hanford Wells.
V. L. McGhan, and D. W. Damschen. May 79, 203p
Contract EY-76-C-06-1830

Descriptors: *Geological surveys, *Hanford Reservation, *Wells, Coordinates, Depth, Documentation, Drilling, Experimental data, Ground water, Sediments, Tables, Waste disposal, Water.
Identifiers: ERDA/580100, ERDA/510100, *Water wells.

For abstract, see ERA citation 04:045473.

8I. Mining Engineering

BETC-0008-2 PC **A07**/MF **A01**
Florida Univ., Gainesville.
Research on Surfactant-Polymer Oil Recovery Systems. Project Status Report, September 1--December 31, 1978.
D. O. Shah, and R. D. Walker, Jr. Apr 79, 131p
Contract EW-78-S-19-0008

Descriptors: *Microemulsion flooding, *Oil wells, *Surfactants, Adsorption, Experimental data, Interfaces, Isolated values, Petroleum deposits, Polymers, Precipitation, Research programs, Rheology, Rocks, Thermodynamics.
Identifiers: ERDA/020300, *Enhanced recovery, Oil recovery.

For abstract, see ERA citation 04:044291.

BETC-2541-12 PC **A06**/MF **A01**
Energy Resources Co., Inc., Cambridge, MA.
Enhanced Oil Recovery by Improved Waterflooding. First Annual Report.
J. B. Edwards. Oct 78, 104p
Contract EF-77-C-01-2541

Descriptors: *Microemulsion flooding, *Oil wells, Demonstration programs, *Enhanced recovery, Oil fields, Research programs, Waterflooding.
Identifiers: ERDA/020300, Oil recovery.

For abstract, see ERA citation 04:044292.

COO-2534-4 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge.
Seismological Investigation of Crack Formation in Hydraulic Rock Fracturing Experiments and in Natural Geothermal Environments. Progress Report, September 1, 1977--August 31, 1978.
K. Aki. Sep 78, 29p
Contract EY-76-S-02-2534

Descriptors: *Geothermal systems, *Hot-dry-rock systems, Cracks, Diffraction, Geologic structures, Hawaii, Hydraulic fracturing, Japan, Mathematical models, Microearthquakes, Microprocessors, Seismic surveys, Seismology.
Identifiers: ERDA/150301, ERDA/150906, Seismic prospecting.

For abstract, see ERA citation 04:038520.

COO-4972-1 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Earth and Planetary Sciences.
Microcrack Technology. Progress Report, 1 October 1978--31 March 1979.
G. Simmons, M. L. Batzle, and S. Shirey. Apr 79, 40p
Contract ER-78-S-02-4972

Descriptors: *Coso hot springs, *Drill cores, *Raft River Valley, Cracks, Electric conductivity, KGRA, Permeability.
Identifiers: ERDA/150303, ERDA/152002, Geothermal fields.

For abstract, see ERA citation 04:042792.

DOE/BG/01569-2 PC **A05**/MF **A01**
CER Corp., Las Vegas, NV.
Western Gas Sands Project. Status Report, 1 December 1978--31 December 1978.
1978, 92p
Contract AC08-79BG01569

Descriptors: *Natural gas, Enhanced recovery, Hydraulic fracturing, Natural gas deposits, Research programs, Sandstones, Well stimulation.
Identifiers: ERDA/020900, *Gas production, Western Region(United States).

For abstract, see ERA citation 04:042308.

DOE/BG/01569-4 PC **A04**/MF **A01**
CER Corp., Las Vegas, NV.
Western Gas Sands Project Status Report, 1 February 1979--28 February 1979.
1979, 65p
Contract AC08-79BG01569

Descriptors: *Natural gas, Demonstration programs, Enhanced recovery, Natural gas deposits,

Research programs, Resource assessment, Sandstones.
Identifiers: ERDA/030900.

For abstract, see ERA citation 04:042332.

DOE/ET-00026-8 PC **A05**/MF **A01**
Gruy Federal, Inc., Houston, TX.
Assessment of Potential Increased Oil Production by Polymer-Waterflood in Northern and Southern Mid-Continent Oil Fields. Progress Report for the Quarter Ending December 31, 1978.
1978, 88p
Contract EW-78-C-19-0026

Descriptors: *Microemulsion flooding, *Oil wells, *Waterflooding, *Enhanced recovery, Oil fields, Petroleum, Research programs.
Identifiers: ERDA/020300, *Oil recovery.

For abstract, see ERA citation 04:038141.

DOE/MC/08089-T1 PC **A03**/MF **A01**
TRW, Inc., McLean, VA. Energy Systems Planning Div.
Methane Recovery from Coalbeds. Integrating Contractor, Annual Report, CY 1978.
1978, 29p
Contract EW-78-C-21-8089

Descriptors: *Coal seams, *Methane, Degassing, Recovery, Research programs.
Identifiers: ERDA/012000, ERDA/090100.

For abstract, see ERA citation 04:040184.

DOE/TIC-10053(V.7) PC **A05**/MF **A01**
Illinois Univ. at Urbana-Champaign. Center for Advanced Computation.
Comparative Coal Transportation Costs: An Economic and Engineering Analysis of Truck, Belt, Rail, Barge and Coal Slurry and Pneumatic Pipelines. Volume 7. Pneumatic Transport. Final Report.
M. Rieber, and S. L. Soo. Aug 77, 77p

Descriptors: *Coal, Cost, Economic analysis, Feasibility studies, *Pneumatic transport, Transport.
Identifiers: ERDA/013000.

For abstract, see ERA citation 04:038116.

DOE/TIC-10128 PC **A03**/MF **A01**
TRW, Inc., McLean, VA. Energy Systems Planning Div.
Methane Recovery from Coalbeds Project Technology Test Projects Evaluation of Candidate Projects.
Feb 79, 26p
Contract EW-78-C-21-8089

Descriptors: *Coal deposits, *Methane, Comparative evaluations, Degassing, Economics, Equipment, Liquefied natural gas, Recovery.
Identifiers: ERDA/012000, Technology.

For abstract, see ERA citation 04:042245.

FE-2605-20 PC **A06**/MF **A01**
Suntech, Inc., Richardson, TX.
Large-Scale Samples of Sulfonates for Laboratory Studies in Tertiary Oil Recovery Preparation and Related Studies. Final Report.
E. W. Malmberg. Jan 79, 104p
Contract EF-77-C-01-2605

Descriptors: *Microemulsion flooding, *Oil wells, *Sulfonates, Alcohols, Brines, Dispersions, Enhanced recovery, Petroleum deposits, Polymers, Salinity, Surfactants.
Identifiers: ERDA/020300, *Enhanced recovery, Oil recovery.

For abstract, see ERA citation 04:044293.

FE-5065-9 PC **A02**/MF **A01**
West Virginia Univ., Morgantown. Dept. of Geology and Geography.
Prediction Model for Compositional Changes within Coal from Core Data. Quarterly Report, July--September 1978.
J. J. Renton, and A. C. Donaldson. 1978, 8p
Contract EY-76-S-05-5065

Descriptors: *Coal seams, *Peat, Chemical composition, Coal, Coal deposits, Deposition, Diagenesis, Geochemistry, Lithology, Maps, Mathematical models, Pyrite, Stratigraphy, Variations, West Virginia.
Identifiers: ERDA/010600, ERDA/011000.

For abstract, see ERA citation 04:040124.

FE-9020-1 PC **A08**/MF **A01**
FMC Corp., Santa Clara, CA. Engineered Systems Div.
Intermediate Drive Belt Conveyor. Final Technical Report, 31 December 1978.
O. L. Jack, and S. K. Riyat. Dec 78, 168p
Contract ET-76-C-01-9020

Descriptors: *Conveyors, *Underground mining, Coal mining, Control systems, Materials, Mathematical models, Mechanical transmissions, Mine haulage, Tensile properties.
Identifiers: ERDA/013000, ERDA/360403.

For abstract, see ERA citation 04:042258.

FE-9095-1 PC **A06**/MF **A01**
Pittsburg and Midway Coal Mining Co., Shawnee Mission, KS.
Application of High Volume Earthmoving Methods to the Reclamation of Area Mined Spoil Banks. Final Report.
J. W. Howland. Feb 78, 114p
Contract ET-75-C-01-9095

Descriptors: *Earthmoving equipment, *Spoil banks, Coal mining, *Land reclamation.
Identifiers: ERDA/012000, ERDA/010900, ERDA/510500.

For abstract, see ERA citation 04:042247.

GJBX-125(78)(V.2) PC **A08**/MF **A01**
High Life Helicopters, Inc., Puyallup, WA.
Aerial Radiometric and Magnetic Survey: Lovelock National Topographic Map, Nevada.
1978, 156p
Contract EY-77-C-13-1678

Descriptors: Nevada, *Uranium deposits, Aerial prospecting, Aerial surveying, Data compilation, Magnetic surveys, Maps, Radiometric surveys.
Identifiers: ERDA/050200, Radioactivity prospecting, Topographic maps, Lovelock National Topographic Map, Uranium ore deposits.

For abstract, see ERA citation 04:025552.

GJBX-126(78)(V.2) PC **A07**/MF **A01**
High Life Helicopters, Inc., Puyallup, WA.
Aerial Radiometric and Magnetic Survey: Walker Lake National Topographic Map, California and Nevada.
1978, 142p
Contract EY-77-C-13-1678

Descriptors: California, Nevada, *Uranium deposits, Aerial prospecting, Aerial surveying, Data compilation, Magnetic surveys, Maps, Radiometric surveys.
Identifiers: ERDA/050200, Radioactivity prospecting, Walker Lake National Topographic Map, Topographic maps, Uranium ore deposits.

For abstract, see ERA citation 04:025554.

GJBX-127(78)(V.1) PC **E05**/MF **A01**
LKB Resources, Inc., Huntingdon Valley, PA.
NURE Aerial gamma-Ray and Magnetic Reconnaissance Survey, Chugach/Yakutat Area, Alaska. Volume I. Narrative Report.
Oct 78, 137p
Contract EY-76-C-13-1664

Descriptors: Alaska, *Uranium deposits, Aerial prospecting, Data.
Identifiers: ERDA/050200, Radioactivity prospecting, Uranium ore deposits, Valdez Quadrangle, Cordova Quadrangle, Bering Glacier Quadrangle, Icy Bay Quadrangle, Mount Saint Elias Quadrangle, Yakutat Quadrangle.

For abstract, see ERA citation 04:029350.

GJBX-2(78)(V.2a) PC **A07**/MF **A01**
GeoMetrics, Inc., Sunnyvale, CA.
Aerial gamma Ray and Magnetic Survey, Van Horn and Pecos Quadrangles, Texas. Volume IIa. Final Report.
Oct 77, 133p
Contract EY-76-C-13-1664

Descriptors: *Gamma radiation, Texas, Aerial monitoring, Diagrams, Geophysical surveys, Magnetic surveys, Radiation monitoring.
Identifiers: ERDA/580203, ERDA/050200, Radioactivity prospecting, Van Horn Quadrangle, Pecos Quadrangle, Charts.

For abstract, see ERA citation 04:028182.

GJBX-65(79)(V.1) PC **E13**/MF **A01**
Geodata International, Inc., Dallas, TX.
Aerial Radiometric and Magnetic Survey: Trona National Topographic Map, California.
11 Dec 78, 165p
Contract EY-76-C-13-1664

Descriptors: California, *Uranium deposits, Aerial prospecting, Aerial surveying, Data compilation, Magnetic surveys, Maps, Radiometric surveys, Tables.
Identifiers: ERDA/050200, Radioactivity prospecting, Topographic maps, Geophysical surveys.

For abstract, see ERA citation 04:040352.

GJBX-72(79) PC **E02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Artillery Peak Orientation Study, Mohave County, Arizona.
K. P. Puchlik, D. L. Leach, and D. Cazes. 12 Mar 79, 40p UCRL-52675
Contract EY-76-C-13-1664

Descriptors: Arizona, *Uranium deposits, Activation analysis, Arid lands, Geochemical surveys, Maps, Neutron reactions, Prospecting, Rocks, Sediments, Surface waters, Thorium, Trace amounts, Uranium.
Identifiers: ERDA/050200, Radioactivity prospecting, Artillery Peak Quadrangle.

For abstract, see ERA citation 04:042365.

GJBX-86(79) PC **A04**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Savannah River Laboratory Semiannual Report, October 1978--March 1979. Hydrogeochemical and Stream Sediment Reconnaissance.
May 79, 51p
Contract EY-76-C-09-0001

Descriptors: *Uranium deposits, Data analysis, Experimental data, Geochemical surveys, Ground water, Research programs, Streams.
Identifiers: ERDA/050200, *Radioactivity prospecting, Hydrogeochemistry.

For abstract, see ERA citation 04:044365.

IS-4691 PC **A04**/MF **A01**
Ames Lab., IA.
Multilaboratory Analytical Quality Control for the Hydrogeochemical and Stream Sediment Reconnaissance. Quality Control Report for April 1979.
A. P. D'Silva, M. A. Floyd, and W. J. Haas, Jr.
May 79, 51p
Contract W-7405-ENG-82

Descriptors: *Geochemical surveys, *Uranium deposits, Quality control, Sediments, Streams.
Identifiers: ERDA/050200, *Radioactivity prospecting, Hydrogeochemistry.

For abstract, see ERA citation 04:044367.

LA-UR-78-2958 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Comparison of Economics of In Situ Coal Gasification with Surface Processing.
N. E. Vanderborgh, G. R. B. Elliott, and G. A. Baca. 1978, 12p CONF-781112-9
Contract W-7405-ENG-36
ASME energy technology conference, Houston, TX, USA, 5 Nov 1978.

Descriptors: *Coal gasification, *In-situ gasification, *Lurgi process, Carbon dioxide, Coal, Com-

parative evaluations, Drying, Economics, Elements, Environmental transport, Oxygen, Pyrolysis, Radioactivity, Trace amounts, Uranium.
Identifiers: ERDA/010404, Cost analysis.

For abstract, see ERA citation 04:028746.

LA-7757-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Wet Geothermal Potential of the Kingman-Williams Region, Arizona.
F. E. Goff. Apr 79, 45p
Contract W-7405-ENG-36

Descriptors: Arizona, *Thermal waters, Aquifers, Chemical composition, Chlorides, Flow rate, Geochemical surveys, Geochemistry, Geology, Geothermometry, Hydrology, Hydrothermal systems, pH value, Resource potential, Temperature measurement.
Identifiers: ERDA/150302, *Geothermal prospecting.

For abstract, see ERA citation 04:042787.

LA-7804-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Aquarius Mountain Area, Arizona: A Possible HDR Prospect.
F. G. West, and A. W. Laughlin. May 79, 19p
Contract W-7405-ENG-36

Descriptors: *Hot-dry-rock systems, Electric conductivity, Electrical surveys, Geology, Geothermal exploration, Gravity surveys, Seismic surveys, Seismic waves.
Identifiers: ERDA/150301, Geothermal systems, *Geothermal prospecting.

For abstract, see ERA citation 04:044660.

LA-7807-HDR PC **A07**/MF **A01**
Los Alamos Scientific Lab., NM.
Hot Dry Rock Geothermal Energy Development Program. Annual Report, Fiscal Year 1978.
M. C. Brown, R. B. Duffield, C. L. B. Siciliano, and M. C. Smith. Apr 79, 132p
Contract W-7405-ENG-36

Descriptors: *Hot-dry-rock systems, Environmental impacts, Flow rate, Fracturing, Geochemistry, Heat extraction, Management, Mathematical models, New Mexico, Planning, Reservoir engineering, Resource potential, Site selection, Technology assessment, Well drilling.
Identifiers: ERDA/150906, ERDA/150300, Geothermal systems.

For abstract, see ERA citation 04:044691.

LBL-7091 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Results of Reservoir Engineering Tests, 1977, East Mesa, California.
T. N. Narasimhan, R. C. Schroeder, C. B. Goranson, and S. M. Benson. Sep 78, 9p CONF-781003-6
Contract W-7405-ENG-48
53. annual technical conference and exhibition of society of petroleum engineers, Houston, TX, USA, 1 Oct 1978.

Descriptors: *East Mesa Geothermal Field, *Geothermal wells, Geology, Geothermal fluids, Imperial Valley, Performance testing, Reservoir engineering, Resource potential.
Identifiers: ERDA/150904, California.

For abstract, see ERA citation 04:038546.

LBL-8538 PC **A02**/MF **A01**
Comision Federal de Electricidad, Mexico City.
Recent Activities at the Cerro Prieto Field.
H. Alonso E, B. Dominguez A, M. J. Lippmann, A. Manon M., and R. C. Schroeder. Dec 78, 14p
Contract W-7405-ENG-48

Descriptors: *Cerro Prieto Geothermal Field, Brines, Cements, Exploratory wells, Geothermal exploration, Geothermal fluids, Geothermal power plants, Power range 10-100 mw, Reviews, Well casings, Well drilling.
Identifiers: ERDA/150303, ERDA/150800, Geothermal fields.

For abstract, see ERA citation 04:042793.

LBL-8918 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Geothermal Energy for Industrial Application.
R. L. Fulton. Mar 79, 19p CONF-790358-1
Contract W-7405-ENG-48
Association of energy engineers conference, San Francisco, CA, USA, 21 Mar 1979.

Descriptors: *Geothermal energy, *Geothermal resources, Geothermal heating, Industry, Power generation, Uses.
Identifiers: ERDA/151000, ERDA/150800, ERDA/150100, Reviewing, Utilization.

For abstract, see ERA citation 04:042809.

NTIS/PS-79/0898/1GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Techniques Used in Ore Treatment Plants. Volume 2. 1975-1977 (Citations from the Engineering Index Data Base).
Rept. for 1975-77,
Diane M. Cavagnaro. Sep 79, 245p*

Descriptors: *Industrial plants, *Metalliferous minerals, *Nonmetalliferous minerals, *Beneficiation, *Bibliographies, Smelting, Roasting, Flotation, Fluidized bed processing, Ion exchanging, Solvent extraction, Process charting, Design, Crushing, Materials recovery, Performance evaluation, Grinding, Sintering, Pollution, Economics, Abstracts.
Identifiers: *Ore treatment plants.

Reports from worldwide research are cited covering treatments of smelting, roasting, flotation, fluidized bed processing, sintering, ion exchange, magnetic separation, solvent extraction, crushing and grinding, pelletizing, and new alternatives. Other aspects that are discussed include pollution, economics, supply and demand, waste utilization, performance evaluation, equipment, energy, and material recovery. (This updated bibliography contains 239 abstracts, none of which are new entries to the previous edition.)

NTIS/PS-79/0899/9GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Techniques Used in Ore Treatment Plants. Volume 3. 1978-July, 1979 (Citations from the Engineering Index Data Base).
Rept. for 1978-Jul 79,
Diane M. Cavagnaro. Sep 79, 377p*
Supersedes NTIS/PS-78/0801 and NTIS/PS-77/0708. See also Volume 1, 1970-1974, NTIS/PS-77/0707 and Volume 2, 1975-1977, NTIS/PS-79/0898.

Descriptors: *Industrial plants, *Metalliferous minerals, *Nonmetalliferous minerals, *Beneficiation, *Bibliographies, Smelting, Roasting, Flotation, Fluidized bed processing, Ion exchanging, Solvent extraction, Process charting, Design, Crushing, Materials recovery, Performance evaluation, Grinding, Sintering, Pollution, Economics, Abstracts.
Identifiers: *Ore treatment plants.

Some of the treatments in worldwide research discussed are smelting, roasting, flotation, fluidized bed processing, sintering, ion exchange, magnetic separation, solvent extraction, crushing and grinding, pelletizing, and new alternatives. The bibliography also discusses pollution aspects, economics, supply and demand, waste utilization, performance evaluation, equipment, energy aspects, and material recovery. (This updated bibliography contains 371 abstracts, 288 of which are new entries to the previous edition.)

ORNL/PPA-79/2 PC **A05**/MF **A01**
Oak Ridge National Lab., TN.
Geopressure Energy Resource Evaluation.
G. Samuels. May 79, 79p
Contract W-7405-ENG-26

Descriptors: *Geopressured systems, *Natural gas wells, Aquifers, Compressibility, Economic analysis, Flow rate, Methane, Permeability, Productivity, Resource development.
Identifiers: ERDA/150904, ERDA/030100, Geothermal resources, Mexico Gulf.

For abstract, see ERA citation 04:044687.

ORO-5205-9 PC **A13**/MF **A01**
Battelle Columbus Labs., OH.
Characterization and Analysis of Devonian Shales as Related to Release of Gaseous Hydrocarbons. Quarterly Technical Progress Report, October--December 1978.
R. S. Kalyoncu, and M. J. Snyder. 15 Jan 79, 287p
Contract EY-76-C-5205

Descriptors: *Black shales, Indiana, Kentucky, *Natural gas deposits, New York, West Virginia, Chemical properties, Devonian period, Drill cores, Exploration, Gas saturation, Graphs, Lithology, Natural gas, Numerical data, Physical properties, Tables.
Identifiers: ERDA/030200, ERDA/040500.

For abstract, see ERA citation 04:029217.

PATENT-4 156 971 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
Contour Measurement System.
Patent,
J. R. Currie, R. R. Kissel, E. T. Deaton, Jr., and R. A. Campbell. Filed 3 Nov 77, patented 5 Jun 79, 8p N79-26439/6, PAT-APPL-848 418
Supersedes PAT-APPL-848 418-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: *Contours, *Measuring instruments, Nonlinear systems, Systems engineering, Mapping, Mines(Excavations), Mining, *Patents, Tracking (Position), Tracks, Yaw.
Identifiers: PAT-CL-33-174.

A measurement system is described, which measures the departures from a straight line of discrete track sections of a track along a coal face in a mine employing a vehicle having a pair of spaced wheel assemblies which align with the track. A reference arm pivotally connects between the wheel assemblies, and there is indicating means for measuring the angle of pivot between the arm and each of the wheel assemblies. The length of the device is less than the length of a track section, and thus when one of the wheel assemblies is on one track section and one is on an adjoining track section, the sum of the indicated angles will be indicative of the angle between track sections. Thus, from the length of a track section and angle, the departure of each track section from the line may be calculated.

PB-297 594/4GA PC **A02**/MF **A01**
Energy Research and Generation, Inc., Oakland, CA.
Thermocorer for Geothermal Applications.
G. M. Benson. 30 Aug 77, 21p NSF/RA-770790
Presented at the IECEC (12th) Held at Washington, DC. on August 30, 1977.

Descriptors: *Coring, *Geothermal prospecting, Drilling, Boreholes, Geothermy, Design, Drawings, Systems analysis, Cost estimates.
Identifiers: *Thermocorer.

Thermocorer, a thermomechanical core-drill, uses recirculating hot melts and rotating jet-nozzles to produce advance rates 1000 times faster than achieved by the Subterrene and at specific energy consumptions approximating those of conventional rotary drills. Advance is produced by forming a kerf with resulting core and glass-lined bore-hole. The kerf is formed by dynamic thermofracturing and the core, of virgin earth, is continuously removed for real-time analysis. The core-shell and bore-casing provide structural support for core removal and hole stabilization. The principles involved are described and are confirmed by experimental and theoretical results. Results of high temperature material studies are presented. System configuration and requirements are detailed. Geothermal energy applications are discussed, including cost and performance predictions, noting the insensitivity of Thermocoring to strata temperature and composition.

PB-297 605/8GA PC **A11**/MF **A01**
Cleveland-Cliffs Iron Co., Rifle, CO. Western Div.
Prototype Underground Demonstration Mine in Oil Shale Deposits.
Open file rept. (Final) Jul 76-Feb 79,

H. D. Raymond, W. A. Skelly, and H. L. Hoe. Mar 79, 227p BUMINES-OFR-69-79
Contract J0265020

Descriptors: Oil shale, Mining, Room and pillar mining, Stope mining, Caving mining, Backfills, Ventilation, Dewatering, Subsidence, Water removal, Maintenance, Design, Drawings, Prototypes, Cost analysis, Operating costs, Fixed investment, Capitalized costs, Piceance Creek Basin, Colorado.
Identifiers: *Oil shale mining, Rio Blanco County(Colorado).

This report contains a summary of designs, specifications, costs, and schedules developed for a prototype oil-shale demonstration mining program to be undertaken at the Horse Draw site in the Piceance Creek Basin, Rio Blanco County, Colo. The objective of the program is to assess the feasibility of extracting oil shale and associated saline minerals from deep, rich oil shale zones that occur within the central portion of the basin. Four mining systems were specified for demonstration. These include (1) chamber and pillar mining with backfill, (2) sublevel stoping with backfill, (3) sublevel stoping with full subsidence, and (4) block caving. The report also contains a detailed breakdown of projected capital and operating costs for the program.

PB-298 458/1GA PC **A25**/MF **A01**
National Oceanic and Atmospheric Administration, Rockville, MD. Marine Minerals Div.
The Lawfulness of Deep Seabed Mining,
Theodore G. Kronmiller. 1979, 578p* NOAA-79070608

Descriptors: *International law, *Mining, Undersea mineral deposits.
Identifiers: *Underwater mining, Law of the sea.

The lawfulness of deep seabed mining is supported by analogies to other uses established to be lawful and by analyses of still further lawful high seas uses, certain aspects of which point toward the reasonableness of deep seabed mining operations. Analogies may convincingly be drawn to fishing, to the laying and maintenance of submarine cables and pipelines and to marine scientific research. Furthermore, upon analysis, important aspects of military maneuvers, missile and bombing practice ranges, ocean dumping and artificial installations, among other uses, lend support to the lawfulness of deep seabed mining. In short, if all the fregoing uses are regarded as lawful under the regime of the high seas, deep seabed mining should also be so regarded. A state or private enterprise may, under international law, appropriate the resources of the seabed beyond the limits of national jurisdiction by means of mining vessels operating on the high seas. Deep seabed mining is clearly within the ambit of the principle of the freedom of the seas and is consistent with rules of customary international law and with relevant conventional law. All States are under a duty to respect the lawful exercise of the freedom to explore and to exploit the resources of the deep seabed.

PB-298 530/7GA PC **A20**/MF **A01**
Ecology Consultants, Inc., Fort Collins, CO.
An Environmental Guide to Western Surface Mining. Part Two: Impacts, Mitigation and Monitoring,
Russell Moore, and Thomas Mills. Dec 77, 467p FWS/OBS-78/04
Contract DI-14-16-0009-77-008
See also Part 1, PB-272 153. Prepared in cooperation with Hittman Associates, Inc., Columbia, MD. Library of Congress catalog card no. 78-51074.

Descriptors: *Surface mining, *Environmental impacts, Strip mining, Land use, Animals, Plants(Botany), Manuals.
Identifiers: *Western Region(United States), Northern Great Plains Region(United States), Rocky Mountain Region(United States), Southwest Region(United States), Environmental protection, Environmental monitoring.

This manual assembles information about the effects of surface mining in the Western United States on fish and wildlife resources and recommends ways to mitigate these effects through carefully planned lease and permit stipulations. Chapter 1 describes the content of the manual and provides guidance to the reader in how to use it most efficiently. Chapter 2 introduces the reader to the regional ecology, the distribution of minerals, and the surface mining techniques likely to be used within the three major geomorphic regions. Chapter 3 provides a detailed list of impact activities associated with surface mining and traces the way in which these activities affect fish and wildlife resources. The effects of these activities are evaluated with respect to various ecosystem components. Chapter 4 contains discussions of how the various mine-related effects may be mitigated at high, medium, and low levels of effort. It also provides an evaluation of existing stipulations which have been commonly used toward these same objectives. Chapter 5 contains a conceptual approach to development of a site-specific monitoring program and provides recommendations for monitoring of individual ecosystem components.

SAND-77-1501 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Calculations of Borehole Springing in Oil Shale (Rock Springs Site 6A).
M. E. Kipp. May 79, 41p
Contract EY-76-C-04-0789

Descriptors: *Oil shale deposits, Borehole linking, *Boreholes, Explosive fracturing, Rock springs sites.
Identifiers: ERDA/040300, ERDA/040401.

For abstract, see ERA citation 04:044345.

SAND-78-1409 PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Portable High-Temperature, High-Pressure Viscometer Development.
R. C. Reineke. Mar 79, 25p
Contract EY-76-C-04-0789

Descriptors: *Drilling fluids, *Viscosimeters, Design, Fabrication, Geothermal wells, Pumps, Rheology, Simulation, Viscosity.
Identifiers: ERDA/150901.

For abstract, see ERA citation 04:044685.

UCRL-81657 PC **A04**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Calibration of a Neutron Log in Partially Saturated Media.
J. R. Hearst. 3 Nov 78, 54p CONF-790605-3
Contract W-7405-ENG-48
20. annual logging symposium, Tulsa, OK, USA, 3 Jun 1979.

Descriptors: *Neutron-neutron logging, *Well logging equipment, Algorithms, Calibration, Epithermal neutrons, Water saturation.
Identifiers: ERDA/440400.

For abstract, see ERA citation 04:041566.

8J. Physical Oceanography

AD-A070 681/2GA PC **A02**/MF **A01**
Rosenstiel School of Marine and Atmospheric Science Miami FL
Relative Sound Velocities of Sea Salts at 25 C,
Frank J. Millero, Gary K. Ward, and Peter V. Chetirkin. 9 Dec 76, 9p Rept no. CONTRIB-2154
Contract N00014-75-C-0173, Grant NSF-OCE-73-00351-A01
Pub. in Jnl. of Acoustical Society of America, v61 n6 p1492-1498 Jun 77.

Descriptors: *Acoustic velocity, *Sea water, Salts, Sound transmission, Salt water, Reprints.

No abstract available.

AD-A070 756/2GA PC **A04**/MF **A01**
Lamont-Doherty Geological Observatory Palisades NY
Tectonics of the Oceanographer Transform: Seismic Evidence,
Hugh Rowlett, and Omar Perez. Sep 78, 60p
Contract N00014-76-C-0818, Grant NSF-DES74-24698

Descriptors: *Ocean bottom, *Earthquakes, *Seismic data, North Atlantic Ocean, Tectonics, Seismographs, *Seismic detection, Monitoring.
Identifiers: Seismic refraction, *Microseisms, MidAtlantic Ridge, Geological faults, Submarine faults, Submarine topographic features, Scarps.

Ocean-bottom seismographs (OBS's) were used in a combined refraction and microearthquake monitoring experiment at the eastern junction of the Oceanographer transform with the mid-Atlantic ridge at 35 N. Microearthquake activity at the junction occurred over a zone at least 7 km wide. Microearthquakes that were located define a linear zone of faulting up to 12 km in length and about 3 km in width that is oblique to both the local strike of the median valley and transform valley and the present direction of spreading. These microearthquakes appear to be associated with fault scarps that form the inner walls on the west and north sides of the median and transform valleys.

AD-A070 757/0GA PC **A04**/MF **A01**
Lamont-Doherty Geological Observatory Palisades NY
A Refraction Experiment Using Ocean Bottom Semismographs and Implications of a Structural Model of the Crest of the Mid-Atlantic Ridge at 37 deg N,
Hugh Rowlett, Keith McCamy, and Paul J. Fox. Sep 78, 63p
Contract N00014-76-C-0818, Grant NSF-DES74-24698
Prepared in cooperation with State Univ. of New York at Albany. Dept. of Geological Sciences.

Descriptors: *Ocean bottom topography, *Earth crust, *Seismic data, North Atlantic Ocean, Seismic waves, Acoustic refraction, Velocity, Seismographs, Seismic arrays, Underwater sound.
Identifiers: Seismic refraction, Acoustic velocity, Tectonics, Ocean bottom spreading, *Seismic detection, Oceanic crust, Models, Lithosphere, Submarine topographic features.

A main goal of marine seismology is to measure seismic velocities to contrain petrologic and structural models of the ocean crust. This is especially important for models of the lower crust which has not yet been reached by drilling and cannot be directly examined. This paper describes the results of a refraction experiment that investigates the discrepancies of previous work in the crestal mountains at 37 N. We also compare the results of our refraction experiment with the other refraction experiments conducted in the median valley at 37 N and propose a structural model for the upper 3 km of oceanic crust at 37 N based on the better constrained experiments.

AD-A070 770/3GA PC **A04**/MF **A01**
Environmental Research Inst of Michigan Ann Arbor Applications Div
Basic Remote Sensing Investigation for Coastal Reconnaissance.
Technical rept.,
D. Lyzenga, R. Shuchman, C. Davis, and G. Suits. Jun 79, 58p Rept no. ERIM-134400-7-T
Contract N00014-78-C-0458
Includes Parts 1, 2 and 3. Presented at the International Symposium on Remote Sensing of Environment (13th), 23-27 Apr 79.

Descriptors: Remote detectors, Ocean bottom topography, *Beaches, Optical scanning, Multispectral, Moisture, Particle spectra, Data processing, Reflectance, Shallow depth, Radiative transfer.
Identifiers: *Remote sensing.

Contents: The use of Remote Sensing in the Determination of Beach Sand Parameters; Shallow-Water Reflectance Modeling with Applications to Remote Sensing of the Ocean Floor; and Evaluation of an Algorithm for Mapping Bottom Features Under a Variable Depth of Water.

AD-A071 054/1GA PC **A02**/MF **A01**
Scripps Institution of Oceanography San Diego CA Marine Physical Lab
Synthetic Seismograms from Model Ocean Bottoms,
P. K. P. Spudich, and Donald V. Helmberger. 14 Feb 77, 24p Rept no. MPL-U-50/76
Contracts N00014-75-C-0749, N00014-75-C-0704
Sponsored in part by Grant NSF-DES74-11909. Pub. in Jnl. of Geophysical Research, v84 n81 p189-204, 10 Jan 79.

Descriptors: *Ocean bottom, *Seismic data, Oceanographic data, Geophysics, Ocean models, Reprints.

Identifiers: *Seismograms, Synthetic seismology.

No abstract available.

AD-A071 090/5GA PC **A02**/MF **A01**
Scripps Institution of Oceanography San Diego CA Marine Physical Lab
Bedforms and the Benthic Boundary Layer in the North Atlantic: A Cruise Report of INDOMED Leg 11.
Summary rept. Aug-Sep 78,
Peter Lonsdale. 29 Dec 78, 25p Rept nos. MPL-U-71/78, SIO-REF-78-30
Contract N00014-75-C-0704

Descriptors: *Ocean bottom, *Sediment transport, Erosion, Ocean currents, North Atlantic Ocean, Boundary layer, Ocean bottom sampling, Benthonic zone, Marine geology, Sea water, Deep oceans, Mapping, Acoustic data, *Oceanographic data.
Identifiers: Mud waves, INDOMED Project, Sediment water interactions, Suspended sediments, Bermuda Rise, Moroccan Rise, Continental rises, Melville vessel, Morocco, *Submarine topography, Nephelometers, Oceanographic charts.

In August and September 1978, deep-tow surveys were conducted with R/V Melville at four sites in the North Atlantic: a field of mud waves on the Moroccan continental rise; a patch of hyperbolae-creating bedforms with interfingering debris flows on the Saharan continental rise; an area of abyssal furrows near the crest of Eastward Scarp on the Bermuda Rise; and a field of furrowed sediment waves on the southwest Bermuda Rise. In addition to near-bottom acoustic records, the deep-tow instrument collected stereo photos, CTD and nephelometer data, and samples of bottom water and suspended sediment. There were also current meter, hydrocast and coring stations. This report includes preliminary deep-tow maps of each site, locating photo runs and samples, and presents a few typical sections of data. (Author)

AD-A071 174/7GA PC **A03**/MF **A01**
Naval Oceanographic Office Washington D C Marine Sciences Dept
Oceanography for Submarine Long Range Sonar in Atlantic Area J for Through July.
Informal manuscript rept.
Dec 63, 41p Rept no. NOO-IM-0-111-63

Descriptors: *Sonar signals, Sound transmission, Acoustic velocity, Underwater acoustics, Long range(Distance), Convergence zone, Bottom bounce, Ray tracing, Ocean surface, Acoustic channels, *North Atlantic Ocean, Spring season, Summer, Oceanographic data, Graphs.
Identifiers: MOST project-2.

No abstract available.

BNL-50895 PC **A03**/MF **A01**
Brookhaven National Lab., Upton, NY.
Data Report: Oceanographic Data from Moored Instrumentation. Velocity and Temperature off Shinnecock, Long Island in October--November 1976.
J. T. Scott, T. S. Hopkins, R. D. Pillsbury, and E. G. Divis. May 78, 45p
Contract EY-76-C-02-0016

Descriptors: *Coastal waters, Data acquisition systems, *Electric conductivity, Temperature distribution, *Water currents, Atlantic Ocean, Buoys, Calibration, Continental shelf, Data acquisition, Depth, Experimental data, Graphs, New York, Performance testing, Telemetry.
Identifiers: ERDA/520100, ERDA/520500, ERDA/580500, ERDA/440300, *Ocean temperature.

For abstract, see ERA citation 04:043776.

8L. Snow, Ice, and Permafrost

AD-A070 572/3GA PC **A03**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Sea Ice Ridging over the Alaskan Continental Shelf,
W. B. Tucker, III, W. F. Weeks, and M. D. Frank. May 79, 31p Rept no. CRREL-79-8
NASA Order-RK-8-0021

Descriptors: *Sea ice, *Ice formation, *Continental shelves, Alaska, Arctic Ocean, Statistical processes, Ridges, Profilometers, Lasers, *Oceanographic data.
Identifiers: *Outer continental shelves, Baseline studies, Chukchi Sea, Beaufort Sea, Point Lay, Cross Island, Barter Island, Point Barrow, Point Wainwright, Point Lonely, Mathematical models.

Sea ice ridging statistics obtained from a series of laser surface roughness profiles are examined. Each set of profiles consists of six 200-km-long flight tracks oriented approximately perpendicular to the coastline of the Chukchi and Beaufort Seas. The landward ends of the profiles were located at Point Lay, Wainwright, Barrow, Lonely, Cross Island and Barter Island. The flights were made in February, April, August, and December 1976, and one additional profile was obtained north of Cross Island during March 1978. It was found that although there is a systematic variation in mean ridge height (h) with season (with the highest values occurring in late winter), there is no systematic spatial variation in h at a given time. The number of ridges/km (micron) is also high during the late winter, with the highest values occurring in the Barter and Cross Island profiles . In most profiles, the ice 20 to 60 km from the coast is more highly deformed (higher micron values) than the ice either nearer the coast or farther seaward. The Wadhams model for the distribution of ridge heights gives better agreement with observed values in the higher ridge categories than does the Hibler model. Estimates of the spatial recurrence frequency of large pressure ridges are made by using the Wadhams model and also by using an extreme value approach. In the latter, the distribution of the lagest ridges per 20 km of laser track was found to be essentially normal.

AD-A071 004/6GA PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Snowpack Optical Properties in the Infrared,
Roger H. Berger. May 79, 16p Rept no. CRREL-79-11

Descriptors: *Snow, Reflectance, Infrared radiation, Grain size, Density, Radiation absorption, Emissivity, Absorption coefficients.
Identifiers: Intermediate infrared radiation, Optical properties, Electromagnetic scattering.

A theory of the optical properties of snow in the 2-20 microns region of the infrared has been developed. Using this theory it is possible to predict the absorption and scattering coefficients and the emissivity of snow, as a function of the snow parameters of grain size and density, for densities between 0.17 and 0.4 g/cu. cm. The absorption and scattering coefficients are linearly related to the density and inversely related to the average grain size. The emissivity is independent of grain size and exhibits only a weak dependence upon density. (Author)

AD-A071 015/2GA PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Accelerated Ice Growth in Rivers,
Darryl J. Calkins. May 79, 10p Rept no. CRREL-79-14

Descriptors: *Ice formation, *Rivers, Heat transfer, Acceleration, Cold weather tests, Freezing, Ice, Meteorological data, Temperature.
Identifiers: Frazil ice, Atmospheric temperature, Mathematical models.

Solid ice growth rates due to the presence of frazil slush beneath the ice cover have been shown to be greater than the so-called static growth. The frazil slush reduces the effective heat of ice solidification and the frazil particles freeze into the interstitial water. Numerical schemes are presented which clearly show the effect of frazil ice porosity on ice cover growth rates and the numerical model using air temperature as the major input is compared with field data on ice thickness in a small river laden with frazil ice beneath its cover. (Author)

AD-A071 038/4GA PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Point Source Bubbler Systems to Suppress Ice,
George D. Ashton. May 79, 18p Rept no. CRREL-79-12

Descriptors: *Ice prevention, *Bubbles, Plumes, Heat transfer, Computerized simulation, Computer programs, Air.
Identifiers: *Point source dissemination, *Bubblers, Fortran.

An analysis of a point source bubbler system used to induce local melting of an ice cover is presented. The analysis leads to a numerical simulation programmed in Fortran which may be used to predict the effectiveness of such systems. An example application is presented using a typical record of average daily air temperatures. The Fortran program for the point source simulation as well as a Fortran program for line source systems are included in the Appendix. (Author)

AD-A071 040/0GA PC **A05**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Seeking Low Ice Adhesion.
Special rept.,
John M. Sayward. Apr 79, 88p Rept no. CRREL-SR-79-11

Descriptors: *Ice, *Adhesion, Deicing materials, Polymers, Silicon compounds, Test methods, Wetting, Surface roughness, Bibliographies.
Identifiers: Contact angle, Surface tension.

Icing impairs operation of helicopters and other aircraft, antennae, power and communication lines, shipping and superstructures, canal locks, etc. Prevention or easier removal of icing requires reduction of its adhesion strength. Literature study shows that adhesion results from secondary (van der Waals) forces yet exceeds normal cohesive strengths. It depends on free surface energy, low contact angle, good contact and wetting, cleanliness, and texture. Modes of adhesion testing are briefly discussed. Poor adhesion occurs with low energy surfaces or contaminants, e.g. hydrocarbons, fluorocarbons, waxes, oils, etc., particularly when textured or porous. The resulting low contact angle, poor wetting and occlusion of air at the interface weaken the bond or provide stress loci which can initiate cracks and failure. Coefficient of expansion differences may help in release of ice. Further ideas appear among the 100 abstracts presented. A survey of over 300 manufacturers produced over 100 replies. Half of them offered some 100 products deemed worth testing. These are listed with addresses and contacts.

AD-A071 065/7GA PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
An Electromagnetic Geophysical Survey at an Interior Alaska Permafrost Exposure.
Special rept.,
P. V. Sellmann, A. J. Delaney, and S. A. Arcone. May 79, 10p Rept no. CRREL-SR-79-14

Descriptors: Geophysics, *Permafrost, Alaska, Roads, Cold weather tests, Construction, Soil mechanics, Civil engineering, Surveys.
Identifiers: Geophysical surveys, Electromagnetic testing, Magnetic induction, Ice.

Road construction activity near Fairbanks, Alaska, in the late fall of 1977, revealed a large exposure of Fairbanks silt containing numerous massive ice features. These exposures are typical of those found in this region. Thaw, during the summer of 1978, caused the upper ice-rich sections to retreat several meters. Geophysical techniques were utilized over these exposures to determine if resistive anomalies of ice wedge dimension could be detected. Magnetic induction measurements at three intercoil spacings and low-frequency surface impedance measurements were made about 6 m from the edge of each exposure in April 1978 before thaw commenced. The results agree well with observations of the layering, but most individual anomalies are difficult to interpret because the lateral extent of the ice is unknown. (Author)

N79-28649/8GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
Passive Microwave Applications to Snowpack Monitoring Using Satellite Data.
D. K. Hall, J. L. Foster, A. T. C. Chang, and A. Rango. Jun 79, 15p NASA-TM-80310
Subm-Submitted for Publication.

Descriptors: *Alaska, Data reduction, Microwave radiometers, Nimbus 5 satellite, *Snow cover, Annual variations, Atmospheric temperature, Brightness temperature, Data processing, Ice formation, Satellite observation, Snow.
Identifiers: Remote sensing.

For abstract, see STAR 1719

PB-298 695/8GA PC **A04**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
Avalanche Dynamics: Engineering Applications for Land Use Planning.
Forest Service research paper (Final),
Charles F. Leaf, and M. Martinelli, Jr. Feb 77, 56p* FSRP-RM-183

Descriptors: *Avalanches, Snow, Land use zoning, Flow, Dynamic pressure, Dynamic characteristics, Computer programs.
Identifiers: Debris, HP-65 programmable calculators.

Voellmy's (1955) avalanche dynamics equations are reviewed and combined with more recent findings of other workers. Equations are used to estimate flow heights, velocities, specific thrust pressure, maximum specific weight of avalanche debris, and runout distance for 12 avalanche case studies from the Colorado Rocky Mountains. Suggestions are made for using this engineering approach for avalanche zoning and land use planning.

8M. Soil Mechanics

AD-A070 839/6GA PC **A06**/MF **A01**
Air Force Inst of Tech Wright-Patterson AFB OH
Total Stress versus Effective Stress Stability Analysis of Embankments on Soft Clay.
Master's thesis,
Steven Craig Boyce. Dec 78, 109p Rept no. AFIT-CI-79-99T

Descriptors: *Embankments, *Stability, Stress analysis, Stresses, Clay, Drainage, Safety, Theses.
Identifiers: Boston blue clay, Highways.

This thesis investigates the use of two types of stability analysis, i.e. total stress and effective stress, for evaluating the factor of safety of embankments constructed on soft clay. Three classes of stability problems are defined based upon the drainage conditions during construction and shear. The use of both types of analyses for each class of stability is discussed. The factors of safety computed for both types of analyses are compared for three situations: eight case studies of actual embankment failures; variation with embankment height for seven embankments; and the long term stability for two hypothetical embankments.

AD-A071 053/3GA PC **A04**/MF **A01**
Army Engineer Waterways Experiment Station Vicksburg MS
Effects of Back-Pressure Saturation Techniques on Results of R Triaxial Compression Tests.
Final rept. Jan-Sep 75,
Robert T. Donaghe, and Frank C. Townsend. May 79, 63p Rept no. WES-MP-GL-79-12

Descriptors: *Soil tests, *Back pressure, Soil mechanics, Test equipment, Compressive properties, Army Corps of Engineers, Civil engineering, Triaxial stresses, Saturation, Test methods, Pore pressure.

Corps of Engineers (CE) soil laboratories achieve 100 percent saturation of R and R triaxial compression test specimens by the use of back pressure applied in small increments concurrently with increase in chamber pressure with adequate time between increments to permit equalization of porewater pressure throughout the specimen. The objective of this procedure is to apply sufficient pressure on the pore water and pore air so that the air is dissolved in the pore water without significantly prestressing (overconsolidating) the specimen. The objectives of this investigation were to determine the effects of the magnitude of back pressure and the procedure by which it is applied on the stress deformation characteristics of soils. The objectives were achieved by comparing results of tests performed on compacted specimens of Vicksburg loess (clayey silt (ML)) and Vicksburg buckshot (plastic clay (CH)) in which the back-pressure saturation procedure was varied and results of tests performed on specimens of Vicksburg buckshot consolidated from a slurry in which the magnitude of the total back pressure was varied. The results indicate that variations in the technique of applying back pressure may significantly affect test results.

PB-298 749/3GA PC **A03**/MF **A01**
Geological Survey, Menlo Park, CA.
Interpretation of Strain-Dependent Modulus and Damping from Torsional Soil Tests,
Albert T. F. Chen, and Kenneth H. Stokoe, II. Jul 79, 47p USGS/GD-79/002

Descriptors: *Soil dynamics, *Soil tests, Stress strain diagrams, Shear modulus, Shear tests, Mechanical hysteresis, Soil properties.

Static torque-twist curves for solid and hollow circular soil specimens with assumed stress-strain relations are generated and presented in dimensionless form. The stress-strain relations were chosen in such a way that they include the nonlinear behavior of many soils. Shear modulus and hysteretic damping determined from the torque-twist curves are compared with shear modulus and hysteretic damping determined from the corresponding stress-strain relations. These comparisons of modulus and damping, given as separate functions of the normalized twist, provide the information needed for making reliable interpretations of data from torsional soil tests. These tests include resonant column, torsional simple shear, and torsional pendulum tests of both solid and hollow specimens.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A070 733/1GA PC **A06**/MF **A01**
Clarkson Coll of Technology Potsdam NY
A Survey of LSI Test Methodology.
Final technical rept. Jul 77-Sep 78,
U. V. Gumaste, and R. M. Mattheyses. May 79, 122p RADC-TR-79-85
Contract F30602-75-C-0082

Descriptors: *Test methods, *Logic circuits, *Integrated circuits, Digital systems, Management planning and control, Reliability(Electronics), Test equipment, Test sets, Sampling, Decision theory, Pseudo random systems, Faults, Signatures, Functions, Structural properties, Literature surveys.
Identifiers: Large Scale Integration, Very Large Scale Integration, Test management.

This report discusses different test methods available for testing Logic Circuits and Large Scale Integrated Circuits (LSI) from Structural, Functional and Random testing viewpoints. Many test schemes have been proposed in the literature and this report attempts to classify the different test schemes into two basic approaches, nmemely, test generation and test application. An attempt is also made to indicate the philosophy underlying different test equipment. The report also incorporates a brief introduction to digital testing which should enable engineers unfamilar with the concepts of digital testing to read this report with minimum external references. (Author)

AD-A070 735/6GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
High Accuracy Microwave S-Parameter Measurements on Solid State Devices.
Interim rept.,
R. E. Neidert. 22 Jun 79, 16p Rept no. NRL-MR-4015

Descriptors: *Solid state electronics, *Semiconductor diodes, *Transistors, *Circuit analysis, Standing wave ratios, Strip transmission lines, Microwave equipment, Automation, Measurement, Voltage, Accuracy.

The absolute accuracy of automatic network analyzer measurement and de-imbedding of microwave S-parameters of solid state devices (diodes or transistors) is not easy to determine. A reasonable rule of thumb is that the fewer inaccurate measurements necessary to get at an answer, the more accurate the answer. The method outlined in this report, especially the low VSWR test equipment case (which uses only one measurement other than the one with the device in place), uses fewer measurements than any other method known. Because of this it is also possible that this measurement and de-imbedding method is the most accurate. (Author)

AD-A070 783/6GA PC **A03**/MF **A01**
Naval Research Lab Washington DC
GaAs FET Device Fabrication and Ion Implantation Technology (Microwave III-V Compound Semiconductors).
Annual summary rept. 1 Oct 77-30 Sep 78,
Kenneth J. Sleger, and Harry B. Dietrich. 27 Jun 79, 29p Rept no. NRL-MR-4020

Descriptors: *Field effect transistors, *Fabrication, *Ion implantation, Photolithography, Microwave equipment, Schottky barrier devices, Gallium arsenides, Indium phosphides, Electrical properties.

Microwave Schottky barrier FETs and ion implantation have been selected to provide a bench mark technology for evaluation of III-V compound semiconductor materials grown at NRL and elsewhere. FETs used here employ a nominal one micron gate length and are processed by a combination of conventional contact photolithography and liftoff techniques. Ion implantation studies have centered about creating doping profiles suitable for active layers in GaAs and InP FETs using semi-insulation (SI) substrates. These substrates are previously qualified by capping with plasma deposited Si3N4 and annealing between 800 C and 850 C for 15-30 minutes (GaAs) or 700 C-750 C for 15 minutes (InP). Samples which show surface conversion after the anneal are rejected. NRL has demonstrated proficiency in being able to implant, cap and anneal both GaAs and InP SI substrates. GaAs FETs were fabricated on ion implanted NRL SI substrates (unintentionally doped) and on commercially supplied Cr doped SI GaAs with epitaxial channel regions. At 8 GHz the noise figure ranged from 3.4 dB - 3.8 dB with 6-8 dB associated gain for these devices. Differences in microwave performance between ion implanted and epitaxial FET was correlated to differences in mobility and and velocity profiles obtained from FAT FET test structures and actual microwave FET devices, respectively. Results suggest the need for improvement in FET process technology and capping technology. (Author)

AD-A070 785/1GA PC **A06**/MF **A01**
Towson Labs Inc Baltimore MD
Shock Performance of a Shipboard Electrical Switchgear.
Final rept.,
Edward W. Clements. 15 Jun 79, 112p Rept no. NRL-MR-4003

Descriptors: *Circuit breakers, Shipboard, Shock tests, Vibration, Malfunctions, Modification, Reliability, Performance(Engineering).
Identifiers: *Switchgear.

Shipboard circuit breakers are required to be shock-certified on the Lightweight Shock Machine (LWSM). In spite of this, breakers sometimes malfunction during ship shock tests or shock tests of switchgear assemblies on the Mediumweight Shock Machine (MWSM). In the study described here, a total of 27 AQB circuit breakers were tested on the LWSM, their performance notes and the shock environments to which they were exposed measured. The same breakers were then installed in a typical shipboard switchgear which was tested on the MWSM, and again the performance of the breakers noted and their shock environments measured. Initially, almost all of the breakers malfunctioned on the LWSM, opening or tripping from the closed position. After some modification and adjustment, a majority of them passed the LWSM test, although some did not. None malfunctioned when installed in the switchgear or the MWSM. Comparison of shock enviroments in terms of peak acceleation indicated the LWSM environment to be several times as severe as the MWSM environment. It appears that the LWSM test is successful in its intended role as a screen-

ing test, so that breakers which pass can be relied on to operate properly during MWSM or ship shock tests. It also appears that breaker malfunction during LWSM tests can be substantially eliminated by proper setting of internal adjustments and/or minor modifications. (Author)

AD-A071 025/1GA PC **A03**/MF **A01**
EIMAC San Carlos CA
Development of a Pyrolytic Graphite Grid Version of the 4CW100,000E.
Final technical rept. 10 Jun 77-26 Oct 78,
Sterling G. McNees. May 79, 33p RADC-TR-79-106
Contract F30602-77-C-0084

Descriptors: *Pyrolytic graphite, *Electron tube parts, *Grids, Mechanical properties, Test and evaluation, High temperature, Electric current, Pulse frequency modulation, Power amplifiers, Curves(Geometry).

The purpose of this project was to evaluate pyrolytic graphite grids. Several tubes were built to the same general geometry as the 4cw100,000E. The X2097U has a pyrolytic grid and screen. The number of grid bars was increased by 50% to improve cutoff characteristics. The stem was redesigned to improve thermal cycling stability. The X2097V in addition had a high density filament which increased perveance by 30%. The tubes are physically interchangeable with the 4CW100,000E and in critical applications requiring high grid and screen dissipation and low drive voltage have superior performance. (Author)

AD-A071 123/4GA PC **A05**/MF **A01**
Hughes Aircraft Co Torrance CA Electron Dynamics Div
Low Band Dual Mode TWT.
Final rept. 1 Apr 78-30 Apr 79,
Matthew Patterson, and Willard Sundquist. 30 Apr 79, 80p Rept no. EDD-W-05082-F
Contract N00014-72-C-0205

Descriptors: *Traveling wave tubes, *Electron guns, Tube grids, Triodes, Tetrodes, Electron beams, Continuous waves, Pulses, Cathodes(Electron tubes), I band, J band, E band, J band, Bias.

Several low band dual-mode guns were constructed with various grid configurations using standard grid construction techniques. These were tested in a beam analyzer to determine consistency of performance between guns of the same configuration and also to determine beam characteristics with different grid configurations (e.g. triode versus tetrode). In addition, a program was undertaken to produce low band dual-mode gun grid structures (tetrode) using a new manufacturing technique to increase dimensional accuracy. Two of these assemblies have been built. (Author)

HCP/T-2079 PC **A14**/MF **A01**
Systems Control, Inc., Palo Alto, CA.
Design and Testing for a System to Monitor Temperature in Underground Electric Power Transmission Cables.
Feb 79, 320p
Contract EX-76-C-01-2079

Descriptors: Computer codes, *Ehv ac systems, *Oil-filled cables, Algorithms, C codes, Computer calculations, Experimental data, Graphs, Mathematical models, Performance testing, Tables, Temperature distribution, Temperature monitoring, Theoretical data, Underground power transmission.
Identifiers: ERDA/200301, *Oil insulated cables.

For abstract, see ERA citation 04:029971.

LBL-7590 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Wide-Band Measuring System for Studying Charge-Coupled Device Characteristics.
B. Leskovar, and C. C. Lo. Jan 79, 8p CONF-781033-38
Contract W-7405-ENG-48
IEEE nuclear science symposium, Washington, DC, USA, 18 Oct 1978.

Descriptors: *Charge-coupled devices, Electronic circuits, Frequency control, Frequency measurement.
Identifiers: ERDA/440300, ERDA/420800.

For abstract, see ERA citation 04:043700.

N79-28420/4GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Efficiency Enhancement of Dual-Mode Traveling Wave Tubes at Saturation and in the Linear Range by Use of Spent-Beam Refocusing and Multistage Depressed Collectors.
P. Ramins, and T. A. Fox. Jul 79, 26p NASA-TP-1486, E-9912

Descriptors: Accumulators, Focusing, *Traveling wave tubes, Beam waveguides, Efficiency, Graphs (Charts), Linearity, Modes, Saturation, Tables (Data).

For abstract, see STAR 1719

N79-28443/6GA PC **A02**/MF **A01**
Research Inst. of National Defence, Stockholm (Sweden).
Undersoekning AV Koaxialkabels Kaenslighet Foer Stoetvaagor I Vatten 1975 (Investigation of the Shock Wave Sensitivity of Coaxial Cable in Water, 1975).
P. Stroem. Apr 78, 12p FOA-C-20233-D4
Language in Swedish.

Descriptors: *Coaxial cables, *Reliability analysis, *Transmission lines, Sensitivity, Shock waves, Transmission efficiency, Underwater tests.

For abstract, see STAR 1719

PATENT-4 135 294
Not available NTIS
Department of Energy, Washington, DC.
Winding a Multi-Pancake Magnet from a Continuous Conductor.
Patent,
R. L. Brown. Filed 24 Mar 78, patented 23 Jan 79, 6p PAT-APPL-889 665
Supersedes PAT-APPL-889 665-78.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Superconducting magnets, Fabrication, Magnet coils, Winding machines.
Identifiers: ERDA/420201, *Patents, *Winding.

For abstract, see ERA citation 04:043599.

PB-298 318/7GA PC **A04**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Electron Devices Div.
Semiconductor Measurement Technology: Thermal Resistance Measurements on Power Transistors.
Final rept.,
Sherwin Rubin, and Frank F. Gettinger. Apr 79, 73p NBS-SP-400/14

Descriptors: *Transistors, Thermal resistance, Semiconductor junctions, Performance evaluation, Temperature measurement.
Identifiers: *Power transistors.

A brief description of the idealized concept of thermal resistance is given along with the problems and pitfalls encountered in applying the concept to power transistors. In addition, the advantages and disadvantages of various electrical techniques for measuring junction temperature (thermal resistance) are described, and a preferred technique, in which the forward-biased emitter-base junction is used as the temperature-sensitive parameter, is usable on all types of bipolar transistors. The measurement procedure is relatively simple and lends itself to industrial measurements as well as for referee purposes. The power interruption circuitry is also relatively fast and simple since only one device terminal is switched. The preferred technique that was developed for measuring the thermal resistance of power transistors has been adopted as EIA Recommended Standard RS-313-B on Thermal Resistance Measurements of Conduction Cooled Power Transistors, dated October 1975.

PB-298 574/5GA PC **A07**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Electron Devices Div.
Measurement Techniques for High Power Semiconductor Materials and Devices: Annual Report, October 1, 1977 to September 30, 1978,
Frank F. Oettinger. Jun 79, 146p NBSIR-79-1756
Contract DOE-EA-77-A-01-6010
See also report dated May 78, PB-281 723.

Descriptors: *Semiconductor devices, *Semiconductors, *Measurement, Silicon, Electrical resistivity, Thyristors, Defects.

This annual report describes NBS activities directed toward the development of measurement methods for semiconductor materials and devices which will lead to more effective use of high power semiconductor devices in applications for energy generation, transmission, conversion, and conservation. It responds to national needs arising from rapidly increasing demands for electricity and the present crisis in meeting long-term energy demands. Emphasis is on the development of measurement methods for thyristors and rectifier diodes. The major tasks under this project are (1) to evaluate the use of thermally stimulated current and capacitance measurements and other deep level measurement techniques as a means for characterizing lifetime controlling or leakage source defects in power grade silicon material and devices, and (2) to develop procedures to enable spreading resistance measurements of thyristor starting material and layer profiles to be made on a reliable basis.

PB-299 172/7GA PC **A04**/MF **A01**
Martin Marietta Aerospace, Orlando, FL.
Investigation of Moisture Measurements, Failure Rate and Leak Rate and a Study of Moisture Infusion.
Final rept.,
R. L. Sulouff. Aug 79, 57p NBS/GCR-79/170
Contract NBS-5-35880, ARPA Order-2397

Descriptors: *Semiconductor devices, *Reliability(Electronics), *Moisture, Life tests, Leakage, Failure, Microelectronics.

A preliminary study of the relationships between moisture infusion, leak size, and device reliability has been completed. Two sets of experiments were conducted. In one, packages constructed with a controlled leak and an oxide-type moisture sensor were placed in a controlled humidity environment and the water vapor content measured as a function of time. The packages tested had leak sizes in the range between 10 to the minus 9 power and 0.00001 atm cc/s. The second experiment was a 5,000-h life test in which 186 packages, each of which contained unpassivated 741 operational amplifier chips, were subjected to an atmosphere with 85-percent relative humidity at 85C. In this case, the packages had measured leak sizes between 10 to the minus 9 power and 0.001 atm cc/s. The results exhibited a great amount of scatter, both because of the primitive nature of the measurement methods available for use in this type of experiment and because of the large variability in both water vapor infusion and the reactions of water vapor on device surfaces. Nevertheless, it can be safely concluded that present leak rate limits for large packages are not low enough to insure that the maximum permissible moisture level will not be exceeded during a reasonable service life.

SAND-78-1648C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Analysis of Latch-Up Prevention in CMOS IC'S Using an Epitaxial-Buried Layer Process.
D. B. Estreich, A. Ochoa, Jr., and R. W. Dutton. 1978, 5p CONF-781210-2
Contract EY-76-C-04-0789
IEEE electron devices meeting, Washington, DC, USA, 4 Dec 1978.

Descriptors: *MOS transistors, Fabrication, Integrated circuits, Performance, Physical radiation effects, Radiation hardening.
Identifiers: ERDA/440200.

For abstract, see ERA citation 04:027697.

SAND-79-0972 PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
IVFOR: A User-Oriented Program Characterizing the Current--Voltage Properties of a Two Terminal Device.
G. R. Lyons, and J. J. Wiczer. May 79, 25p

Contract EY-76-C-04-0789

Descriptors: *Computer codes, *Semiconductor devices, Basic, Electric conductivity, Hp computers, I codes, On-line measurement systems, Testing.
Identifiers: ERDA/420800, IVFOR computer program, Electrical measurement.

For abstract, see ERA citation 04:045241.

9B. Computers

AD-A070 518/6GA PC **A04**/MF **A01**
Army Armament Research and Development Command Dover NJ Fire Control and Small Caliber Weapon Systems Lab
The Harr Transform: Its Theory and Computer Implementation.
Final rept. Jun-Oct 76,
Gary Sivak. Apr 79, 56p ARSCD-TR-78005, AD-E400 309

Descriptors: *Image processing, *Transformations(Mathematics), Digital systems, Computer applications, Fourier analysis, Computations, Time, Subroutines, Flow charting.
Identifiers: Haar transformation.

Haar functions, square wave step functions of various rates of value change or 'sequency', take on the values +1, -1, and 0 in the interval (0, 1). Since Haar functions form an orthogonal system, any digital function or set of digital data can be represented as a linear combination of these functions, just as Fourier analysis represents data as a linear combination of sines and cosines. The Fast Haar Transform algorithm developed in this paper drastically reduces the number of operations required to transform a set of 16 data elements, i.e., from 256 to only 30. Therefore, one of the chief advantages that the Fast Haar Transform has over the Fast Fourier Transform is that it is between four and five times faster in terms of the number of computer calculations required, thereby reducing the cost of the computer time needed by 80 percent.

AD-A070 523/6GA PC **A03**/MF **A01**
Inst for Advanced Computation Sunnyvale CA
Texture Extraction on the ILLIAC IV.
Final rept.,
Richard M. Brown, and Marsha Jo Hannah. 15 May 79, 40p IAC-TM-5768, IAC-REF-77-15/1, ETL-0191

Descriptors: Aerial photography, Computer applications, Texture, Minimax technique, Parallel processors, Digital maps, Algorithms.
Identifiers: *Feature extraction, Illiac 4 computers, Pixels, Image processing.

IAC has developed texture extraction programs that run on the ILLIAC IV parallel processor. It has used these programs to extract two different texture measures from 32 aerial images provided by ETL. These textures are based on the MAX-MIN technique on the computation of spatial dependence matrices. This report provides high-level descriptions of the texture algorithms, the software system created to implement these algorithms, the test and verification efforts and the results and conclusions. (Author)

AD-A070 530/1GA PC **A04**/MF **A01**
Texas Univ at Arlington Dept of Computer Science
Implementation and Evaluation of Interval Arithmetic Software. Report 4: The IBM 370, DEC 10, and DEC PDP-11/70 Systems.
Technical rept.,
Ronnie G. Ward. Apr 79, 75p WES-TR-O-79-1
Contracts DACA39-76-M-0247, DACA39-76-M-0356

Descriptors: Arithmetic, Test methods, Data processing.
Identifiers: IBM-370 computers, PDP-11/70 computers, *Interval arithmetic, Decsystem-10 computers, INTERVAL 2 system, Computer programming.

Using interval arithmetic as prescribed in the Interval II package is simple because of the AUGMENT preprocessor. Computer runs illustrate that interval arithmetic can show the instability of an algorithm for a given set of data. On the other hand, interval arithmetic can establish a high level of confidence in an algorithm for a given set of data. Interval arithmetic should be used (as any tool would be) where accuracy is of critical importance. Interval arithmetic is expensive to use in terms of computer time, main storage, and personnel time spent in error analysis. Some reasonable means of estimating the cost of using interval arithmetic in a given situation should be developed. These costs would be important in the decision process of determining whether or not internval arithmetic would be worth the effort or not. Techniques of accuracy extension on short word length machines should be examined.

AD-A070 552/5GA Not available NTIS
Army Electronics Command Fort Monmouth NJ Communications/ADP Lab
MCF: A Military Computer Family for Computer-Based Systems,
Alan B. Salisbury. 1976, 4p
Availability: Pub. in Signal, Jul 76 (No copies furnished by DDC).

Descriptors: *Computer architecture, Military applications, Standardization, Computer programming, Digital computers.
Identifiers: MCF computers.

No abstract available.

AD-A070 673/9GA PC **A04**/MF **A01**
MITRE Corp Bedford MA
Generalized Cyclic Codes Finite Field Arithmetic. Volume III.
Technical rept.,
T. F. Roome. May 79, 70p MTR-3227-VOL-3, ESD-TR-79-124-VOL-3
Contract F19628-78-C-0001

Descriptors: Charge coupled devices, Error correction codes, Arithmetic, Delay lines, Cycles.
Identifiers: *Cyclic block codes, Finite field arithmetic.

The implementation of finite field arithmetic processing elements in charge-coupled device technology for cyclic error coding is investigated. The strong coupling between the capabilities of the multiple signal level charge-coupled device delay line and the structures needed for nonbinary finite field arithmetic algorithms is shown to have a potential for realizing resource efficient error control coding computational hardware. Laboratory results are described, and recommendations are made in areas where device characteristics require improvement to better meet the needs of the coding structures. (Author)

AD-A070 687/9GA Not available NTIS
Jet Propulsion Lab Pasadena CA
Data Spaces wih Indirect Addressing,
Armin B. Cremers, and Thomas N. Hibbard. 11 May 77, 23p
Contract N00014-77-C-0536
Availability: Pub. in Mathematical Systems Theory, v12 p151-173 1978 (No copies furnished by DDC).

Descriptors: Mathematical models, *Addressing, Programming languages, Reprints.
Identifiers: Data processing.

No abstract available.

AD-A070 752/1GA PC **A04**/MF **A01**
Honeywell Inc Minneapolis MN Systems and Research Center
Set of Sample Problems for DOD High Order Language Program. GREEN Solutions.
Apr 79, 75p
Contract MDA903-77-C-0331
Prepared in cooperation with CII Honeywell Bull, France. See also AD-A070 753.

Descriptors: *High level languages, *Problem solving, Adaptive systems, Algorithms, Routing, Real time, Scheduling, Data processing, Networks, Electronic switching, Data bases, Parallel processing, Input output processing.
Identifiers: GREEN programming language, Programming languages.

Contents: Polled Asynchronous Interrupt; Priority Interrupt System; A Small File Handling Package; Dynamic Pictures; A Database Protection Module; A Process Control Example; Adaptative Routing Algorithm for a Node within a Data Switching Network; General Purpose Real-Time Scheduler; Distributed Parallel Output; and Unpacking and Conversion of Data.

AD-A070 753/9GA PC **A06**/MF **A01**
Honeywell Inc Minneapolis MN Systems and Research Center
The GREEN Language; An Informal Introduction.
Apr 79, 104p
Contract MDA903-77-C-0331
Prepared in cooperation with CII Honeywell Bull, France. Supplement to report dated Apr 79, AD-A070 752.

Descriptors: *High level languages, Programming manuals, Computer applications, Adaptive systems, Conversion, Counting methods.
Identifiers: GREEN programming language, Programming languages.

This document is an introduction to the GREEN programming language. Like any introduction, we emphasize the concepts that form the foundation of the language, rather than attempt to describe the entire language or to provide a self-contained guide for writing programs. Our objective is to convey the essence of the language, mainly through examples. We assumethat the reader has experience in another higher order programming language. Noother particular kind of expertise is assumed. This introduction is organized in three successive levels: Chapter 1. This opening chapter provides a very brief sketch of the facilities that have an analogue in many other higher order languages. The discussion is based on four small example programs, Chapters 2 through 4. These chapters provide a much more thorough treatment of the facilities sketched in Chapter 1. In particular, we treat the notion of data types, the basic statements in the language, and the facilities for writing subprograms; and Chapters 5 through 9. These chapters describe the facilities needed in many important applications. In particular , we treat the development of program packages, parallel processing, exception handling, the interface with an implementation, and separate translation.

AD-A070 771/1GA PC **A25**/MF **A01**
Computer Sciences Corp Silver Spring MD System Sciences Div
Central Flow Control. Software Design Document. Volume II. Support Complex (SPCX).
Final rept.
Jan 79, 594p CSC/SD-78/6172(2), FAA-RD-79-33-2
Contract DOT-FA77WA-3955

Descriptors: Computer program documentation, *Data processing, Data management, Control, Data bases, Computer programs, Hierarchies, Compilers, Flow charting, Programming languages.
Identifiers: *CFC system, Central flow control.

The Software Design Document (SDD), a deliverable under Contract DOT-FA77WA-3955, is a design document that defines the translation of the Central Flow Control (CFC) Software System functional requirements established in the Federal Aviation Administration's (FAA) Computer Program Functional Specifications (CPFSs) into implemented Software Programs. The SDD describes the exact configuration of the computer programs produced for the CFC Software System. It provides a complete technical description of the software functions, structures, operating environment, data organization, visual table of contents, program listings, and data and module cross references. Volume II describes the Support Complex (SPCX) which operates in an off-line mode. The SPCX is comprised of the System Development, System Generation, System Test, and System Analysis subsystems. (Author)

AD-A070 776/0GA PC **A08**/MF **A01**
General Electric Corporate Research and Development Schenectady NY
Advanced Archival Memory.
Interim rept. no. 6, 1 Jan-1 Jul 78,
M. S. Adler, P. V. Gray, C. G. Kirkpatrick, H. G. Parks, and G. E. Possin. Mar 79, 155p AFAL-TR-79-1028

Contract F33615-76-C-1322, ARPA Order-3194
See also Rept. no. AFAL-TR-78-96, AD-A066 298.

Descriptors: *Memory devices, *Fabrication, End milling, Electron beams, Layers, Selenium alloys, Arsenic alloys, Substrates, Silicon, Eutectics, Metal films, Sputtering, Gold, Electron microscopy, Archives.
Identifiers: Advanced Archival Memory System.

This report covers the effort for the first eight months of 1978. The contract has been redirected from the ion damage writing concept to one based on electron beam milling of thin layers of selenium-arsenic on silicon diode detectors. Background surrounding the redirection can be found in the introduction. Work in the reporting period has concentrated on evaluating two all-electron beam storage concepts (alloy junction and electron beam milling). The electron beam milling approach has been chosen, and an advanced high current electron probe is being purchased for use in evaluating this storage concept. (Author)

AD-A070 781/0GA PC **A06**/MF **A01**
Army Missile Research and Development Command Redstone Arsenal AL Technology Lab
ACSL Macros for Analog Operators.
Technical rept.,
David B. Merriman. 10 Oct 78, 118p Rept no. DRDMI-T-79-7

Descriptors: *Macroprogramming, Programming languages, Analog systems, Algorithms, Models, Computerized simulation.
Identifiers: *Analog operators.

A set of analog operators was implemented in the Advanced Continuous Simulation Language as a set of macros. These macros are compatible with the Electronic Associates, Incorporated ECSSL hybrid compiler. (Author)

AD-A070 845/3GA PC **E06**/MF **E06**
Federal Cobol Compiler Testing Service Washington DC
COBOL Compiler Validation Summary Report. UNIVAC VS/9, COBOL 74.
15 Apr 79, 93p Rept no. FCCTS/CCVS74-VSR380

Descriptors: High level languages, Programming languages, *Compilers, Standardization, Errors, Validation, Accuracy.
Identifiers: Validation summary reports, *Cobol, Software engineering, Operating systems, Univac-90/80 computers, Flagging, Proving, VS/9 compiler.

This Validation Summary Report (VSR) for the UNIVAC Series 90 COBOL Compiler Version 05.00/16 (VS/9 Version --) provides a consolidated summary of the results obtained from the validation of the subject compiler against the 1974 COBOL Standard (X3.23-1974/FIPS PUB 21-1). The compiler was validated at the High Intermediate level of FIPS PUB 21-1. The VSR is made up of several sections showing the discrepancies found. These include an overview of the validation which lists all categories of discrepancies by level/module within X3.23-1974, a section relating the categories of discrepancies to each of the Federal levels of the language; and a detailed listing of discrepancies together with the tests which were failed. (Author)

AD-A070 846/1GA PC **E06**/MF **E06**
Federal Cobol Compiler Testing Service Washington DC
COBOL Compiler Validation Summary Report. UNIVAC OS/3, COBOL 74.
15 Apr 79, 96p Rept no. FCCTS/CCVS74-VSR385

Descriptors: High level languages, *Compilers, Programming languages, Standardization, Errors, Validation, Accuracy.
Identifiers: *Cobol, Validation summary reports, Software engineering, Operating systems, UNIVAC 90/30 Computers, Flagging, OS/3 compiler, Proving.

This Validation Summary Report (VSR) for the UNIVAC Series 90 COBOL Compiler Version 06.02/00 (OS/3 Version ---) provides a consolidated summary of the results obtained from the validation of the subject compiler against the 1974 COBOL Standard (X3.23-1974/FIPS PUB 21-1). The compiler was validated at the high level of FIPS PUB 21-1. The VSR is made up of several sections showing the discrepancies found. These include an overview of the validation which lists all categories of discrepancies by level/module within X3.23-1974, a section relating the categories of discrepancies to each of the Federal levels of the language; and a detailed listing of discrepancies together with the tests which were failed. (Author)

AD-A070 848/7GA PC **A07**/MF **A01**
Goodyear Aerospace Corp Akron OH
Microcomputer Array Processor.
Final rept. 2 Jun 75-2 Aug 78,
R. H. Ries, R. A. Hujar, F. C. Carty, and M. H. Diehl. Oct 78, 139p GER-16565, AFAL-TR-78-157
Contract F33615-75-C-1179

Descriptors: *Microcomputers, Data processing equipment, Arrays, Multiprocessors, Parallel processors, Computer architecture, Fabrication, Bench tests, Electronic warfare, Feasibility studies, Input output processing, Hybrid computers, Flow charting.
Identifiers: *Array processors.

The objective of this work was to design, fabricate, and bench test a feasibility model of an EW computer architecture based on utilizing multiple microprocessors in a multiprocessor system. The developed model consists of four microprocessors integrated into a tightly coupled nearly symmetrical structure exhibiting a master-slave relationship among its processors. Each microprocessor is composed of a 32-bit CPU and a dedicated local program memory. The function of the multiprocessor is to sort pulse trains based on digital pulse intercepts collected by a wide-open channelized receiver. Once the multiprocessor determines the PRI of an emitter, all emitter parameters are passed to a preprocessor which is inserted in the data stream between the receiver and the multiprocessor. The function of the preprocessor is to remove from the data stream all pulses from emitters identified by the multiprocessor. The feasibility model preprocessor can accept a peak receiver output pulse rate of 340,000 pulses per second.

AD-A070 850/3GA PC **A05**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
User's Manual for FVSOLVR and FVPLOT: Field Solving and Plotting Computer Programs.
Technical note Sep 75-Dec 78,
Brian R. Milner. Mar 79, 76p Rept no. CEL-TN-1549

Descriptors: Programming manuals, Computer programs, Voltage, *Poisson equation, Symmetry, Thermal properties, Dielectrics, Electrical insulation, Problem solving.
Identifiers: *Laplace equation, *Computer graphics, *FVSOLVR computer program, *FVPLOT computer program.

FVSOLVR and FVPLOT are, respectively, computer programs which solve and plot field distributions for problems that involve the solution of Laplace's equation. The programs were developed primarily for solving electric field and equipotential distributions, but may be adapted to solve problems such as temperature distributions or problems which involve the solution of Poisson's equation. They can also be used with either axisymmetric or two-dimensional geometries. This user's manual provides the detailed information required to implement problem solutions with these programs. (Author)

AD-A070 867/7GA PC **A03**/MF **A01**
Puk (Richard F) Albuquerque NM
Device Implementation Guidelines for the Three-Dimensional Graphics Compatibility System (GCS).
Final rept.,
Richard F. Puk. Mar 79, 50p WES-MP-O-79-2
Contract DACA39-78-M-0053

Descriptors: *Computer graphics, Three dimensional, Subroutines, Instruction manuals, Compatibility.
Identifiers: GCS system, Auxiliary equipment(Computers).

This report develops guidelines for implementing new devices for the three-dimensional version of the Graphics Compatibility System (GCS). Included are the definition of device-dependent graphics, status area initialization values, functional specification of device-dependent routines, factors involved in supporting intelligent refresh devices, and a phased sequence for implementing new devices. (Author)

AD-A070 907/1GA PC **A05**/MF **A01**
George Washington Univ Washington DC Dept of Electrical Engineering and Computer Science
Raster Graphics Extensions to the Graphics Compatibility System (GCS).
Final rept.,
James D. Foley, James Templeton, and Dara Dastylar. Mar 79, 81p WES-MP-0-79-3
Contract DACA39-78-M-0073

Descriptors: *Computer graphics, *Rasters, Computer programs, Graphic arts, Computer architecture, Polygons.
Identifiers: GCS system.

This report discusses a set of architectural extensions to line drawing graphics packages to support various raster displays. A series of subroutine calls and their functional descriptions are given. Specific recommendations are made on how to integrate the raster extensions into the Graphics Compatibility System (GCS). (Author)

AD-A070 928/7GA PC **A04**/MF **A01**
Massachusetts Univ Amherst Dept of Computer and Information Science
An Image Segmentation System Based on Thresholding.
Interim rept.,
Ralf Kohler. Dec 78, 54p Rept no. COINS-TR-78-23
Contract N00014-75-C-0459

Descriptors: *Image registration, Computer applications, *Image processing, Threshold effects, Segmented, Contrast, Edges, Algorithms.

The segmentation algorithm proposed in this paper is a complex form of thresholdsing which utilizes multiple thresholds. The algorithms consists of two major components: a threshold selection component and a relaxation component. The threshold selection component automatically selects a threshold so as to maximize the global average contrast of edges detected by the threshold across the image. This algorithm for threshold selection compares favorably with other methods for automatic threshold selection. The threshold selection algorithm can be applied recursively to select additional thresholds by ignoring any edges which have already been detected by previously selected thresholds. The relaxation is independently performed for each threshold selected. The resulting binary images are intersected to produce the final segmentation. This algorithm works well not only for simple images but also produces reasonable segmentations for complex images.

AD-A070 930/3GA PC **A13**/MF **A01**
Massachusetts Inst of Tech Cambridge Lab for Computer Science
The MDL Programming Language,
Stuart W. Galley, and Greg Pfister. Jun 79, 280p
Contract N00014-75-C-0661

Descriptors: *Programming languages, Data processing, Computer programming, Computer aided instruction, Debugging(Computers).
Identifiers: MUDDLE programming language, MDL programming language.

The MDL programming language began existence in late 1970 (under the name MUDDLE) as a successor to LISP (Moon, 1974), a candidate vehicle for the Dynamic Modeling System, and a possible base for implementation of Planner (Hewitt, 1969). The original design goals included and interactive integrated environment for programming, debugging, loading, and editing; ease in learning and use: facilities for structured, modular, shared programs; extensibility of syntax, data types and operators; data-type checking for debugging and optional data-type declarations for compiled efficiency: associative storage, coroutining, and graphics.

AD-A070 944/4GA PC **A06**/MF **A01**
Motorola Inc Scottsdale AZ Government Electronics Div
Video Memory Modules.
Final rept. 1 Sep 77-15 May 78,
Larry A. Hopper. Feb 79, 118p AFAL-TR-79-1003
Contract F33615-77-C-1142

Descriptors: *Read write memories, Video frames, Modules(Electronics), *Buffer storage, *Video integration, Display systems, Charge coupled devices, Antijamming, Forward looking infrared systems, Data links.
Identifiers: Computer storage devices.

This report summarizes the results of the exploratory development of a video frame store memory which can (a) lower the sensor frame rate to provide increased A/J protection, and (b) refresh a TV monitor at the normal rate while operating at reduced frame rates. Also, a similar unit for second-generation FLIR systems was investigated to (a) freeze the display momentarily to give an observer additional time to search for details, and (b) to improve system sensitivity for the detection of fixed or slowly moving objects by integrating successive frames of video as the image is displayed. This effort is being conducted in parallel with investigations at AFAL to develop a low-cost A/J video data link for advanced RPV's and guided missiles. This exploratory development was divided into two phases. The first phase was devoted to circuit design and module definition. The second phase involved the brassboard fabrication and testing of two prototype video memories for RPV bandwidth reduction systems employing 64K digital CCD memories for the primary frame store function. The primary goal was to realize the imaging system at a minimum of memory cost, size, weight and power dissipation through the use of a common modular packaging approach. (Author)

AD-A070 955/0GA PC **A06**/MF **A01**
Carnegie-Mellon Univ Pittsburgh PA Dept of Computer Science
The Representation of Families of Software Systems.
Interim rept.,
Lee W. Cooprider. 14 Apr 79, 101p CMU-CS-79-116, AFOSR-TR-79-0732
Contract F44620-73-C-0074, Grant NSF-DCR74-244573

Descriptors: Programming languages, *Computer programming, Data bases, Mathematical programming, Maintenance, Systems analysis, Editing.

Programming languages are notations for the representation of algorithmic information, they are tools for 'programming-in-the-small' (DeRe76). System description languages are notations for 'programming-in-the-large'. Because software systems often exist in several versions simultaneously, a system description language must accomodate parallel versions of systems and permit the natural expression of the information sharing among those versions. The construction of software systems involves sequences of construction processes such as text editing, compilation, document production, linkage editing, and cross-reference generation. Automation of these processes has been impeded by the use of inadequate models of software construction and maintenance. As a result, the enforcement of design decisions described in a system description language has been left to human agencies.

AD-A070 957/6GA MF **A01**
Maryland Univ College Park Dept of Computer Science
Testing Data Abstractions through Their Implementations.
Interim rept.,
Richard Hamlet, Mark Ardis, John Gannon, and Paul McMullin. May 79, 40p TR-761, AFOSR-TR-79-0796
Grant AFOSR-77-3181
Availability: Microfiche copies only.

Descriptors: *Programming languages, Test and evaluation.
Identifiers: Data abstractions, DAISTS system.

A data abstraction can be specified by a syntactic (domain range) description of its objects and operations on them, plus a set of axioms describing the behavior of the operations. In a programming language that supports abstraction, abstract objects are given a representation in terms of built-in data types (or other, previously defined abstractions), and the abstract operations are defined as procedures. The implemented abstraction has a meaning, acquired from the definition of the programming language; the axioms also specify an independent meaning. The crucial question is then whether or not either meaning is 'correct,' that is, whether it corresponds to the desired abstraction that the programmer has in mind. Using a finite collection of tests, the axiom meaning and the code meaning can be compared for consistency. A compiler-based system, DAISTS, is described for automating this process.

AD-A070 959/2GA MF **A01**
Strategic Air Command Offutt AFB NE
The Interface of COBOL and FORTRAN on the Honeywell 6080 and IBM 370/3033 Computer Systems.
Final technical rept.,
David W. Lind, Roger D. Geer, James W. White, and Donald P. McCanless. 1 Apr 79, 217p
Availability: Microfiche copies only.

Descriptors: *Programming languages, Digital computers, Compatibility, Interfaces, Subroutines, Linkages, Transfer, Fortran.
Identifiers: Cobol, H-6080 computers, IBM-370 computers, *Computer program transferability.

This report describes the research performed in the interface of the COBOL and FORTRAN programming languages on the IBM 370/3033 and the Honeywell 6080 computers. It identifies specific problem areas in the linkage of the two languages and the transference of programs between machines. The report also includes solutions and alternatives to most difficulties encountered and recommendations for successful language interface and program transfer from one computer to the other. (Author)

AD-A070 960/0GA PC **A05**/MF **A01**
General Electric Co Sunnyvale CA
A Simulation Modeling Approach to Understanding the Software Development Process.
Final rept.,
J. A. McCall, G. Y. Wong, and A. H. Stone. Jun 79, 100p AFOSR-TR-79-0776
Contract F49620-78-C-0054

Descriptors: Computerized simulation, Cost estimates, Air Force research, Computer programming, Management planning and control.
Identifiers: *Software engineering.

This report, prepared for the Air Force Office of Scientific Research (AFOSR), describes an assessment of the feasibility of utilizing simulation techniques to aid in the management of large-scale software developments. A model of the software development process was constructed, state-of-the-art prototype simulation tools used, and an experiment conducted to demonstrate the feasibility. A result of this effort is the concept of a Software Development Process Simulator which could be utilized to assist in project planning (cost estimation) and project control (progress status assessment). (Author)

AD-A070 961/8GA PC **A02**/MF **A01**
Maryland Univ College Park Lab for Pattern Analysis
Pattern Analysis and Modeling.
Final technical rept. 1 Sep 77-28 Feb 79,
Laveen N. Kanal. Apr 79, 12p AFOSR-TR-79-0787
Grant AFOSR-76-2901

Descriptors: *Pattern recognition, Decision theory, Artificial intelligence, Problem solving, Classification, Hierarchies, Searching, Algorithms, Parsers, Minimax technique, Dynamic programming, Data bases.
Identifiers: Trees(Mathematics), Computer programming, Heuristic methods.

The report summarizes research progress in new approaches to search and extraction of structure in patterns which include a nondirectional parallel search algorithm which has been shown to be better than the alpha-beta search algorithm when dealing with game trees. New methodology for the design of hierarchical statistical classifiers includes use of state-space ordered search algorithms and introduction of heuristics to cut down the number of decision rules to be tried in a dynamic programming approach to optimizing the decision policies at the nodes of a decision tree. Also described are contributions to the modeling of communication channels with memory and the investigation of models of database query languages. Among the papers published on the research performed under this grant, the following two papers present substantive overviews of the research and place the work in the perpective of other contributions in the areas discussed. Both papers include extensive lists of references. The two papers are: Laveen N. Kanal, 'Problem-Solving Models and Search Strategies for Pattern Recognition' IEEE Trans. on Pattern Analysis and Machine Intelligence, Volume 1, Number 2, p. 193-201, April 1979; and Laveen N. Kanal, and A. R. K. Sastry, 'Modeling Channels with Memory and their Applications to Error Control', Proc. of the IEEE, Volume 66, Number 7, p. 724-744, July 1978.

AD-A070 973/3GA PC **A23**/MF **A01**
Computer Sciences Corp Silver Spring MD System Sciences Div
Central Flow Control Software Design Document. Volume I. Operational Software Complex (OPCX).
Final rept.
Jan 79, 543p CSC/SD-78/6172-1, FAA-RD-79-33-1
Contract DOT-FA77WA-3955
See also Volume 2, AD-A070 771.

Descriptors: Computer programs, Specifications, Computer architecture, Systems analysis, *Data processing, Real time, Data bases, Control systems, Flow.
Identifiers: Central flow control, *CFC system.

The Software Design Document (SDD), is a design document that defines the translation of the Central Flow Control (CFC) Software System functional requirements established in the Federal Aviation Administration's (FAA) Computer Program Functional Specifications (CPFSs) into implemented Software Programs. The SDD describes the exact configuration of the computer programs produced for the CFC Software System. It provides a complete technical description of the software functions, structures, operating environment, data organization, visual table of contents, program listings, and data and module cross references. Volume I describes the Operational Complex (OPCX) which operates in real-time mode. The OPCX is comprised of the Executive, Database, Simulation, and Applications subsystems.

AD-A070 996/4GA PC **A03**/MF **A01**
Toronto Univ (Ontario) Dept of Electrical Engineering
Performance Prediction and Evaluation for the AN/UYK-20 and AN/UYK-7 Computers,
V. C. Hamacher, S. G. Zaky, and S. Rannem.
1975, 43p
Contract N00014-75-C-1174

Descriptors: Digital computers, Data processing, Computer architecture, Minicomputers, Central processing units, Registers(Circuits), Memory devices, Cyclic rate, Subroutines.
Identifiers: MULAD subroutine, MULSB subroutine, Regression equations, SHFTM subroutine, PDP-11/20 computers, Supernova computers, *Computer performance evaluation, *AN/UYK-20 computers, *AN/UYK-7 computers.

A review is given for a technique that relates the performance of the CPU 1 Main Memory section of small computers to standard design parameters such as wordlength, number of registers, etc. The technique was constructed from execution time and memory space data obtained by applying three small benchmark program kernels to fifteen computers. The data was used to determine regression equations that provide a best fit to the data. Time and space equations were developed for each kernel. Three or four variables from the set of design parameters were used as the independent variables in each equation. These variables were chosen, in each case, as the ones that accounted for most of the variation in the observed data. This report applies these equations to both the AN/UYK-20 and AN/UYK-7 computers to pre-

dict their time and space values with respect to the three kernels. The kernels have been programmed for these two machines and the actual time and space values obtained are compared to the predicted results, as well as to the actual results obtained for the fifteen computers in the original study. (Author)

AD-A071 010/3GA PC **E06**/MF **E06**
Federal Compiler Testing Center Washington DC
COBOL Compiler Validation Summary Report. Control Data Corporation NOS/BE Operating System.
1 May 79, 92p Rept no. CCVS74-VSR390

Descriptors: *Compilers, Validation, Reports, Programming languages, Standards, Errors.
Identifiers: *Cobol, Validation summary reports, NOS/BE system, Proving, CDC computers.

The purpose of the Validation Summary Report (VSR) is to identify individual COBOL language elements whose implementation does not conform to American National Standard Programming Language COBOL, X3.23-1974, and to Federal Standard COBOL as adopted from the American National Standard by Federal Information Processing Standard 21-1 (FIPS PUB 21-1).

AD-A071 011/1GA PC **E06**/MF **E06**
Federal Compiler Testing Center Washington DC
COBOL Compiler Validation Summary Report. DECSYSTEM 10, Model 1090 COBOL-74, Version 12.
1 May 71, 84p Rept no. CCVS74-VSR400

Descriptors: *Compilers, Validation, Standards, Programming languages, Auditing, Test methods.
Identifiers: *Cobol, Validation summary reports, Decsystem-10 computers, Proving.

The purpose of the Validation Summary Report (VSR) is to identify individual COBOL language elements whose implementation does not conform to American National Standard Programming Language COBOL, X3.23-1974, and to Federal Standard COBOL as adopted from the American National Standard by Federal Information Processing Standard 21-1 (FIPS PUB 21-1). The Validation Summary Report is prepared by analyzing the results of running the COBOL Compiler Validation System (CCVS). The COBOL Compiler Validation System consists of audit routines containing features of Federal Standard COBOL, their related data, and an executive routine (VP-routine) which prepares the audit routines for compilation. Each audit routine is a COBOL program which includes many tests and supporting procedures indicating the result of the tests.

AD-A071 012/9GA PC **E06**/MF **E06**
Federal Compiler Testing Center Washington DC
COBOL Compiler Validation Summary Report. DECSYSTEM 20, Model 2050 COBOL-74, Version 12.
1 May 79, 85p Rept no. CCVS74-VSR405

Descriptors: *Compilers, Validation, Standards, Programming languages, Test methods, Errors, Editing.
Identifiers: *Cobol, Validation summary reports, Proving, Decsystem-20 computers.

the purpose of the Validation Summary Report (VSR) is to identify individual COBOL language elements whose implementation does not conform to American National Standard Programming Language COBOL, X3.23-1974, and to Federal Standard COBOL as adopted from the American National Standard by Federal Information Processing Standard 21-1 (FIPS PUB 21-1).

AD-A071 030/1GA PC **A04**/MF **A01**
SRI International Menlo Park CA Computer Science Lab
Formal Techniques for Fault-Tolerance in Distributed Data Processing (DDP).
Final rept.,
Jack Goldberg, William Kautz, Leslie Lamport, and Peter Neumann. 3 Apr 79, 72p
Contract DASG60-78-C-0046

Descriptors: *Fault tolerant computing, Data processing, Hierarchies, Diagnosis(General), Specifications, Redundancy, Systems analysis, Networks, Computer programming.
Identifiers: *Distributed processing.

Distributed data processing can lead to systems with greatly improved reliability when compared with conventional systems, and can offer flexible strategies for redundancy, self-testing, and reconfiguration. DDP systems also have potential advantages in security, efficiency, and evolvability. The work in this contract is aimed at providing a suitable theoretical basis for the development of practical techniques for DDP system design and verification. Three fundamental issues have been investigated and are reported here: hierarchical structure in DDP systems; achievement of consistent redundant data representations in faulty networks--specification, design, and validation; and self-diagnosability in DDP networks.

AD-A071 035/0GA PC **A03**/MF **A01**
RAND Corp Santa Monica CA
Modeling Planning as an Incremental, Opportunistic Process.
Technical rept.,
Barbara Hayes-Roth, Frederick Hayes-Roth, Stanley J. Rosenchein, and Stephanie Cammarata. Jun 79, 50p Rept no. RAND/N-1178-ONR
Contract N00014-78-C-0039
See also Rept. no. RAND/R-2366-ONR, AD-A064 445 and Rept. nos. RAND/P-6311, RAND/N-1170-ONR and RAND/N-1179-ONR.

Descriptors: *Planning, Computerized simulation, Artificial intelligence, Management planning and control, *Decision making, Problem solving, Learning, Skills.
Identifiers: INTERLISP programming language, Mathematical models.

Planning is the process of formulating an intended course of action. In this paper we present a model of planning and describe the current version of an INTERLISP simulation of the model. We also review psychological results which confirm the model's basic assumptions for human planning behavior. (Author)

AD-A071 050/9GA PC **A06**/MF **A01**
General Research Corp Santa Barbara CA Systems Technologies Group
An Experimental Evaluation of Software Testing.
Final rept.,
C. Gannon, R. N. Meeson, and N. B. Brooks. May 79, 107p GRC-CR-1-854, AFOSR-TR-79-0733
Contract F49620-78-C-0103

Descriptors: Computer programs, Computer aided instruction, Computer program reliability, *Computer program verification, Test and evaluation, Compilers, Editing.
Identifiers: Fortran, DAVE system, SQLAB system.

The techniques evaluated are path (branch) coverage testing and static analysis. The basic approach was to prepare programs for testing by seeding them with errors whose type and frequency are typical of new software at the integration- or system-level of testing. The experiments were conducted in three phases. The first used eight small programs from a popular programming manual, the second and third used a 5000-line FORTRAN program used to simulate ballistic-missile defense engagements. For the most part, both the path testing and static analysis used the SQLAB tool, with the techniques used singly and in combination. In Phase 1, the DAVE system's static analysis capabilities were also used. In Phase 3, the techniques were compared with the techniques of intermediate-value printout and control-flow tracing. The inescapable conclusion remains, however, that fully automated computer-aided testing is not possible at present. Further, the errors that are not detected are generally considered difficult to locate by conventional techniques.

AD-A071 069/9GA PC **A02**/MF **A01**
Washington Univ St Louis MO Dept of Systems Science and Mathematics
The Constraint Method for Solid Finite Elements.
Interim rept. 1 Oct 76-30 Sep 77,
I. Norman Katz. Sep 77, 21p AFOSR-TR-79-0844
Grant AFOSR-77-3122

Descriptors: *Finite element analysis, Cantilever beams, Elastic properties, Convergence, Stiffness, Matrices(Mathematics), Stress strain relations.
Identifiers: Constraints, Computer programming, COMET-X system.

With an exception, all finite element software systems have element libraries in which the approximation properties of elements are frozen. The user controls only the number and distribution of finite elements. The exception is an experimental software system, called COMET-X, which employs conforming elements based on complete polynomials of arbitrary order. The elements are hierarchic; i.e., the stiffness matrix of each element is embedded in the stiffness matrices of all higher order elements of the same kind. The user controls not only the number and distribution of finite elements but their approximation properties as well. Thus convergence can be achieved on fixed mesh. This provides for very efficient and highly accurate approximation and a new method for computing stress intensity factors in linear elastic fracture mechanics. The theoretical developments are outlined, numerical examples are given and the concept of an advanced self-adaptive finite element software system is presented.

AD-A071 082/2GA PC **A03**/MF **A01**
Battelle Columbus Labs OH
Authoring Systems Versus Authoring Languages for Instructional Systems Development: Implications for Department of Defense.
Technical rept.,
C. Victor Bunderson. Sep 78, 46p ARI-TR-78-A10
Contract DAJC04-72-A-0001
Prepared in cooperation with Brigham Young Univ., Provo, UT.

Descriptors: *Computer aided instruction, Artificial intelligence, Computer aided design, Programming languages, Training, Semantics, Computer architecture, Department of Defense.
Identifiers: Authoring systems.

This is one of a series of Technical Reports dealing with the authoring process and Computer-Based Instruction (CBI) and Artificial Intelligence. The distinction between authoring systems and authoring languages are noted, and the major goals for effective authoring are set forth. Critical goals include the need to (1) reduce the costs for authoring and production of computer-based instruction materials and (2) maintain or increase the quality of these materials. Primary constraints are the high turnover of authoring personnel and the need for authoring systems (for military purposes) to fit within the framework of the current Instructional System Development (ISD) model. (Author)

AD-A071 088/9GA PC **A05**/MF **A01**
Purdue Univ Lafayette IN School of Electrical Engineering
Improvements in Some Image Compression Techniques for Aerial Reconnaissance Analysis.
Final technical rept. 1 Jul-30 Sep 78,
O. R. Mitchell, S. C. Bass, E. J. Delp, T. W. Goeddel, and A. Tabatabai. May 79, 100p RADC-TR-79-99
Contract F30602-78-C-0102

Descriptors: *Aerial reconnaissance, Information processing, Data compression, Coding, Aerial photography, Photographic analysis, Spatial filtering, Discrete Fourier transform, Digital systems, Quantization.
Identifiers: Pixels, *Image processing.

In this study a number of image coding methods were implemented and applied to aerial reconnaissance photos for relative ranking evaluations by experienced photo-analysts. These coding methods were of three broad types: two-dimensional transform, one-dimensional hybrid, and spatial. The compression rates used were 1.6 and 0.5 bits/pixel. The effects of channel errors at a .001 error rate were also simulated and evaluated.

AD-A071 105/1GA MF **A01**
System Development Corp Santa Monica CA
A Deductive Capability for Data Management,
Charles Kellogg, Philip Klahr, and Larry Travis. 1976, 16p

Contract N00014-76-C-0885
Prepared in cooperation with Wisconsin Univ., Madison, WI.
Availability: Microfiche copies only.

Descriptors: *Data management, Information processing, Systems analysis, Augmentation, Machine translation, Information retrieval, Data bases, Compilers, Problem solving.
Identifiers: *Data base management systems, Deduction.

This paper examines some of the problems and issues involved in designing a practical deductive inference processor to augment a data management system, as well as some of the benefits that can be expected from such an augmentation. A deductive processor design is presented that incorporates new techniques for selecting, from large collections of mostly irrelevant general assertions and specific facts, the small number needed for deriving an answer to a particular query. (Author)

AD-A071 114/3GA PC **A03**/MF **A01**
Battelle Columbus Labs OH
Aspects of Effective Authoring Systems and Assistance: Recommendations for Research and Development.
Technical rept.,
Karl L. Zinn, and Alfred Bork. Sep 78, 35p ARI-TR-78-A9
Contract DAJC04-72-A-0001
Prepared in cooperation with Michigan Univ., Ann Arbor and California Univ., Irvine.

Descriptors: Programming languages, *Computer aided instruction, Programmers, History.

This is one of a series of papers dealing with the authoring process and related problems in Computer-Based Instruction (CBI). It provides a brief historical background of computer based authoring systems, gives details of some of the contributions that the computer has made in the development of more effective teaching materials, outlines the most important aspects of the authoring process and provides some recommendations for future research and development. (Author)

AD-A071 136/6GA PC **A02**/MF **A01**
Aerospace Corp El Segundo CA Engineering Group
A Matrix Spatial and Temporal Matched Filter for Background Suppression.
Final rept.,
S. M. Melzer. 25 Apr 79, 15p TR-0079(4901-03)-3, SAMSO-TR-79-11
Contract F04701-78-C-0079

Descriptors: *Spatial filtering, *Image processing, Background noise, Noise reduction, Digital filters, Matched filters, Correlation techniques, Target detection.
Identifiers: Maximum likelihood estimation.

The maximum likelihood method is applied to the problem of extracting the correct sequence of spatial patterns from the corresponding sequence of measurement frames corrupted by background noise. Each measurement frame is modeled as the sum of a pattern matrix and a background noise matrix. The model proposed for the statistics of the sequence of background matrices results in jointly Gaussian elements whose correlations are product separable in row, column, and frame indices. The logarithm of the likelihood function is computed and involves a matched filtering operation on the measurement frames, which acts to suppress the background relative to the pattern. Because of the product separability in the background element correlations, this matched filtering operation is accomplished by pre- and post-multiplying the measurement frames by the inverses of the background row and column correlation matrices, respectively. Thus, the measurement frames are operated on in their original matrix format without resorting to stacking. Applications include the detection of targets in background noise. (Author)

AD-A071 143/2GA PC **E06**/MF **E06**
Federal Cobol Compiler Testing Service Washington DC
COBOL Compiler Validation Summary Report. Control Data Corporation NOS Operating System.
19 Jun 79, 94p Rept no. FCCTS/CCVS74-VSR395

Descriptors: *Compilers, Validation, Standards, Programming languages, Errors.
Identifiers: *Cobol, Validation summary reports, Proving, CDC computers, NOS system.

This Validation Summary Report (VSR) for the CDC NOS COBOL Compiler Version 5.2/485 (NOS Version 1.3/485) provides a consolidated summary of the results obtained from the validation of the subject compiler against the 1974 COBOL Standard (X3.23-1974/FIPS PUB 21-1). The compiler was validated at the HIGH level of FIPS PUB 21-1. The VSR is made up of several sections showing the discrepancies found. These include an overview of the validation which lists all categories of discrepancies by level/module within X3.23-1974, a section relating the categories of discrepancies to each of the Federal levels of the language; and a detailed listing of discrepancies together with the tests which were failed.

AD-A071 152/3GA PC **A06**/MF **A01**
Hughes Aircraft Co Culver City CA Technology Support Div
Reliability Evaluation of Programmable Read-Only Memories (PROMs). Part III: Ultraviolet Erasable PROMs.
Final technical rept. 13 May 77-13 May 78,
A. P. Arquero, R. L. Barch, M. B. Colligan, and R. L. Long, Jr. May 78, 101p HAC-P78-341R-PT-3, RADC-TR-79-92-PT-3
Contract F30602-75-C-0294

Descriptors: *Memory devices, Reliability(Electronics), Specifications, Programmed instruction, High reliability, Life tests, Military applications, Erasure, Procurement, Test and evaluation.
Identifiers: Programmable read only memories.

Ultraviolet erasable programmable read-only memories (UV-PROMs), type 2708 and 8192-bits capacity, were evaluated. Military grade parts were obtained from two manufacturers. All parts were put through screening tests for package hermeticity, erasability, programmability, and electrical performance. A Tektronix S-3260 automatic test system was used for electrical measurements. 'Shmoo' plots showed that these UV-PROMs can operate with power supply tolerance of + or - 10 percent at -55 to +125 C. Retention of data during storage was found to be adequate.

AD-A071 178/8GA PC **A02**/MF **A01**
IBM Thomas J Watson Research Center Yorktown Heights NY
Optimum Adaptive Array Processor,
J. H. Chang, and F. B. Tuteur. 1967, 25p
Prepared in cooperation with Yale Univ., New Haven, CT. Dept. of Engineering and Applied Science.

Descriptors: *Signal processing, Sonar arrays, Passive sonar, Stochastic processes, Acoustic delay lines, Autocorrelation, Signal to noise ratio, Adaptive systems, Optimization, Spatial filtering, Transfer functions.
Identifiers: MOST project-3, Robbins Monro method, *Array processors, Algorithms.

This paper deals with the design and analysis of an adaptive array processor for use in passive detection of directional stochastic signals such as are found in sonar. The processor consists of a set of tapped delay-line filters, one for each array element. The algorithm used for adjusting the tap gains is a modification of the stochastic approximation method of Robbins and Monro, and it utilizes knowledge of the signal autocorrelation function and spatial direction of the target. It is shown that the final form approached by the processor is that of a space-time filter optimized in the direction corresponding to assumed target location. The system performance is analyzed by considering a noise field consisting of a spatially isotropic component and a single directional component referred to as an interference. It is shown that although the system initially cannot discriminate between the target and the interference, it eventually acts to eliminate the effect of the interference almost completely. It is also shown how the useful signal to noise ratio increases during adaptation. (Author)

AD-A071 192/9GA PC **A03**/MF **A01**
Systems Control Inc Palo Alto CA
On Program Synthesis Knowledge.
Journal article,
Cordell Green, and David Barstow. Jul 77, 41p
Contract N00014-79-C-0127, DARPA Order-3687
Prepared in cooperation with Stanford Univ. CA. Dept. of Computer Science. Contract MDA903-76-C-0206. Sponsored in part by Grant NSF-MCS77-05740. Pub. in Artificial Intelligence, v10 n3 p241-279 Nov 78.

Descriptors: *Computer programming, Computer aided instruction, Data processing, Subroutines, Sorting, Reprints.
Identifiers: Program synthesis.

No abstract available.

BNL-26010 PC **A03**/MF **A01**
Brookhaven National Lab., Upton, NY.
Use of SYSTEM 2000 in a Scientific Research Environment.
C. M. Benkovitz. Apr 79, 26p CONF-790461-1
Contract EY-76-C-02-0016
Spring meeting of the association of SYSTEM 2000 Users for technical exchange (ASTUTE), Austin, TX, USA, 3 Apr 1979.

Descriptors: *Air pollution, Computer codes, *Data base management, CDC computers, Evaluation, New York, Performance, S codes.
Identifiers: ERDA/990300, Data bases, SYSTEM 2000.

For abstract, see ERA citation 04:044192.

LA-7612-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Comparison of Single-Parameter Adaptive Filters.
J. E. Brolley. Jan 79, 14p
Contract W-7405-ENG-36

Descriptors: *Digital filters, Comparative evaluations, Performance, Signals.
Identifiers: ERDA/990200, *Adaptive filters.

For abstract, see ERA citation 04:028611.

LA-7752-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Interactive Use of Computer Drawn Faces to Study Multidimensional Data.
L. A. Bruckner, and C. F. Mills. Mar 79, 30p
Contract W-7405-ENG-36

Descriptors: *Chernoff faces, *Computer graphics, CDC computers, D codes, Data processing, Fortran.
Identifiers: ERDA/990200, DRFACE computer program, Computer programming.

For abstract, see ERA citation 04:045764.

LA-7840-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
High-Speed Graphics Terminal Interface for a PDP-11 Minicomputer.
A. E. Spencer. May 79, 10p
Contract W-7405-ENG-36

Descriptors: *Computer graphics, PDP computers, Display devices, Equipment interfaces, Performance.
Identifiers: ERDA/990200, *PDP-11 computers.

For abstract, see ERA citation 04:045765.

LBL-8277 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Long Term File Migration. Part I: File Reference Patterns.
A. J. Smith. Aug 78, 47p
Contract W-7405-ENG-48

Descriptors: Memory devices, Automation, Operation, Stanford linear accelerator center, Text editors, Time-series analysis, Uses.
Identifiers: ERDA/990200, ERDA/990300, *Data storage, *Data management systems.

For abstract, see ERA citation 04:044180.

LBL-8560 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Time-Sharing Terminal Adapted for Use by Blind Computer Users.
K. Fjelsted. Nov 78, 11p CONF-790113-2

Contract W-7405-ENG-48
12. annual international conference on system sciences, Honolulu, HI, USA, 4 Jan 1979.

Descriptors: *Computer output devices, Design, Man, Microprocessors, Programming, Sense organs diseases, Vision.
Identifiers: ERDA/990200, Blindness, Physicaly handicapped, Humans.

For abstract, see ERA citation 04:028615.

NTIS/PS-79/0865/0GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Information Security and Protection. Volume 2. July, 1977-July, 1979 (Citations from the NTIS Data Base).
Rept. for Jul 77-Jul 79,
Brian Carrigan. Sep 79, 102p*
Supersedes NTIS/PS-78/0860, NTIS/PS-77/0629, NTIS/PS-76/0562, and NTIS/PS-75/437. For the companion Published Search of the Engineering Index Data Base, see NTIS/PS-79/0866. See also Volume 1, 1964-June, 1977, NTIS/PS-78/0859.

Descriptors: *Data processing security, *Bibliographies, Central processing units, Computer programming, Security, Protection, Vulnerability, Computer networks, Risk, Reliability, Secure communications, Disasters, Records management, Abstracts.
Identifiers: *Computer information security, *Computer privacy, Personal privacy, Privacy Act(1974).

The bibliography of Federally-funded research covers the various aspects of computer information security and computer privacy, including personal privacy, reliability of security procedures, natural disasters, audits, electronic crime, implications of the Privacy Act of 1974, and software design for efficiency checks. (This updated bibliography contains 93 abstracts, 42 of which are new entries to the previous edition.)

NTIS/PS-79/0866/8GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Information Security and Protection (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 79,
Brian Carrigan. Sep 79, 249p*
Supersedes NTIS/PS-78/0861, NTIS/PS-77/0630, and NTIS/PS-76/0563. For the companion Published Searches of the NTIS Data Base, see NTIS/PS-78/0859, and NTIS/PS-79/0865.

Descriptors: *Data processing security, *Bibliographies, Central processing units, Computer programming, Security, Protection, Vulnerability, Computer networks, Risk, Reliability, Secure communications, Disasters, Records management, Abstracts.
Identifiers: *Computer information security, *Computer privacy, Personal privacy, Privacy Act(1974).

The bibliography of worldwide research includes the various aspects of computer information security and computer privacy, including personal privacy, reliability of security procedures, natural disasters, audits, electronic crime, and software design for efficiency checks. (This updated bibliography contains 242 abstracts, 60 of which are new entries to the previous edition.)

NTIS/PS-79/0872/6GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Pattern Recognition and Image Processing. Volume 3. August, 1977-July, 1979 (A Bibliography with Abstracts).
Rept. for Aug 77-Jul 79,
Brian Carrigan. Sep 79, 293p*
Supersedes NTIS/PS-78/0846, NTIS/PS-77/0686, NTIS/PS-76/0609, NTIS/PS-75/514, and NTIS/PS-74/084. See also Volume 1, 1964-June, 1975, NTIS/PS-76/0608 and Volume 2, July, 1975-July, 1977, NTIS/PS-78/0845.

Descriptors: *Pattern, recognition, *Character recognition, *Bibliographies, Signal processing, Coding, Color, Mapping, Data processing, Aerial photography, Abstracts.
Identifiers: *Image processing, Image enhancement, Image restoration, Feature extraction, Scene analysis, Edge detection.

The bibliography cites research reports on pattern recognition and image processing. Research on processing color pictures, image enhancement and restoration, feature extraction, edge detection, and scene analysis are included. Optical character recognition is excluded, but is available as a separate bibliography. (This updated bibliography contains 284 abstracts, 138 of which are new entries to the previous edition.)

NTIS/PS-79/0879/1GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Networks. Volume 3. August, 1977-July, 1979 (A Bibliography with Abstracts).
Rept. for Aug 77-Jul 79,
Brian Carrigan. Sep 79, 250p*
Supersedes NTIS/PS-78/0878, NTIS/PS-77/0728, NTIS/PS-76/0632, and NTIS/PS-75/524. See also Volume 1, 1969-June, 1975, NTIS/PS-76/0631 and Volume 2, July, 1975-July, 1977, NTIS/PS-78/0877.

Descriptors: *Computer networks, *Bibliographies, Computer programming, Computer systems hardware, Telecommunication, Time sharing, Queueing theory, Scheduling, Data transmission, Economic analysis, Abstracts.
Identifiers: Communications networks, ARPA computer network, OCTOPUS computer network, TENEX system, Distributed networks.

The bibliography cites research reports on aspects of computer networks, including hardware, software, data transmission, time sharing, and applicable theory to network design. Specific studies on the ARPA network, the OCTOPUS network, the TENEX system, distributed networks, and other such systems are cited. (This updated bibliography contains 244 abstracts, 86 of which are new entries to the previous edition.)

NTIS/PS-79/0884/1GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Storage Management (A Bibliography with Abstracts).
Rept. for 1964-Jul 79,
Brian Carrigan. Sep 79, 215p*
Supersedes NTIS/PS-78/0803, NTIS/PS-77/0775, NTIS/PS-76/0669, NTIS/PS-75/528, and NTIS/PS-74/095.

Descriptors: *Computer storage devices, *Bibliographies, Semiconductor computer storage, Read only storage, Allocations, Computer programming, Compilers, Abstracts.
Identifiers: *Computer storage management, Paging, Virtual memory, File structures.

The cited reports cover dynamic storage allocation, paging, interleaved memory, and virtual memory. Also included are the necessary programs, compilers, and algorithms for implementation in various computer systems. (This updated bibliography contains 209 abstracts, 4 of which are new entries to the previous edition.)

N79-28419/6GA PC **A10**/MF **A01**
ORI, Inc., Silver Spring, MD.
Advanced Risk Assessment of the Effects of Graphite Fibers on Electronic and Electric Equipment, Phase 1.
Final Report.
L. S. Pocinki, L. D. Kaplan, M. E. Cornell, and R. Greenstone. May 79, 217p NASA-CR-159027
Contract NAS1-15379

Descriptors: *Aircraft accidents, *Carbon fibers, Computer programs, *Electric equipment, Graphite-epoxy composite materials, *Risk, *Vulnerability, Airports, Dispersing, Electronic equipment, Monte carlo method.
Identifiers: *Aviation safety.

For abstract, see STAR 1719

ORNL/TM-6597 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
User's Guide to Program MAD: a Computer Program for the Organization and Manipulation of Magnetic Tape Directories.
W. H. Gray. May 79, 39p
Contract W-7405-ENG-26

Descriptors: Computer codes, Thermonuclear devices, Computer calculations, M codes, PDP computers.
Identifiers: ERDA/700105, *Data base management systems, *MAD computer program, Decsystem-10 computers, Data tapes.

For abstract, see ERA citation 04:044085.

PB-298 577/8GA PC **A03**/MF **A01**
California Univ., San Diego, La Jolla. Dept. of Electrical Engineering and Computer Sciences.
Universal P-Code Definition, Version (0.3),
Richard L. Sites, and Daniel R. Perkins. Jul 79, 45p UCSD/CS-79/037
Supersedes PB-292 082. Sponsored in part by Los Alamos Scientific Lab., NM., and California Univ., Livermore. Lawrence Livermore Lab.

Descriptors: *Assembly languages, *Compilers, Programming languages, Semantics, Optimization, Fortran, Computer programs.
Identifiers: *PASCAL programming language, P codes, U codes, Cray-1 computers, S-1 computer.

Universal P-code (U-code) is a compiler intermediate language into which many existing Pascal P-codes can be mapped. The motivation for inventing U-code was to provide an intermediate language particularly suitable for code optimization. A significant side effect of having a single U-code is to enhance the portability of software, specifically compilers, optimizers and translators/interpreters for U-code. Currently, processors exist to map Pascal and Fortran into U-code, and to map Cray-1 P-code into U-code. In turn, processors exist to map Pascal and Model (a Los Alamos Scientific Laboratory Pascal-based language) into Cray-1 P-code. Translators also exist to map U-code into Cray-1 P-code and into S-1 machine language. It is expected that eventually other U-code processors will exist. A U-code to U-code optimizer is being built at UCSD. This document is the official definition of U-code, version (0.3) as a language independent of the existing U-code processors. Nonetheless, motivating material is drawn from the Optimizer and other needs.

PB-298 731/1GA PC **A06**/MF **A01**
Mathematics and Computation Lab., Washington, DC. Information Science Div.
IMS 11: An Information Management System for the PDP 11 Computer.
Final rept.,
Nathan J. Ray. Jun 79, 111p* GSA/FPA/MCL-TM-274

Descriptors: Data retrieval, Random access computer storage, Manuals.
Identifiers: *File management systems, File maintenance, IMS 11 system, PDP-11 computers, Interactive systems.

IMS 11 is a user-oriented information management system which facilitates the manipulation of data files on the PDP 11 Series Computing Equipment. IMS 11 features a query language based on a keyword concept and a random access technique that allows for rapid on-line updating as well as retrieving of data. IMS 11 provides a file definition facility that allows users to associate meaningful names with data fields and subsequently to process the data by using the associated names as variables. The system is conversational in nature and is designed to service many users simultaneously while operating under control of the STAMOS time-sharing system.

SAND-79-0700 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Task Manager for the Motorola 6800.
P. D. Merillat. May 79, 27p
Contract EY-76-C-04-0789

Descriptors: *Microprocessors, Safeguards, Control, Gamma detection, Management, Radiation detectors.
Identifiers: ERDA/055001, ERDA/990200, *Operating systems, Motorola-6800 computers.

For abstract, see ERA citation 04:044410.

UCID-18196 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Eclipse Users Manual.
H. S. Ames. Jun 79, 41p
Contract W-7405-ENG-48

Descriptors: Lawrence Livermore laboratory, Algol, Cobol, Computers, Fortran, Manuals, Programming.
Identifiers: ERDA/990200, *Eclipse computer, Programming manauals, BASIC programming language, FORTRAN 4 programming language, FORTRAN 5 programming language, Computer systems hardware.

For abstract, see ERA citation 04:045769.

9C. Electrical and Electronic Engineering

AD-A070 884/2GA PC **A04**/MF **A01**
Harry Diamond Labs Adelphi MD
User's Manual for SCWAR – A Multiwire Shielded Cable Code for a Systems Oriented EMP Vulnerability Assessment Program.
Technical rept.,
Michael J. Vrabel. May 79, 75p Rept no. HDL-TR-1887

Descriptors: *Electromagnetic shielding, *Electromagnetic pulses, *Machine coding, *Programming manuals, Computer programs, Computations, Vulnerability, Radiation hardening, Electric wire, Electric cables, Circuit analysis, Computer program documentation.
Identifiers: SCWAR computer program.

SCWAR is a shielded multiwire cable code for a system oriented program of electromagnetic pulse (EMP) vulnerability assessment and hardening. Two versions of the code are presented with the larger capable of handling upward of 59 wires. SCWAR interfaces with the output of a single-wire cable code to generate sufficient data for a Thevenin or Norton equivalent circuit for any conductor pair, wire to wire or wire to shield. Provisions are included to introduce cable loss terms and to ease the difficulties associated with interfacing the output with a circuit analysis code. The code is intended to complement an earlier theory-oriented report: The Multiwire Shielded Array--Theory and Code (Harry Diamond Laboratories HDL-TR-1873, October 1978). Included with the code is full user documentation. (Author)

9D. Information Theory

AD-A071 081/4GA MF **A01**
Naval Postgraduate School Monterey CA
An Analytic Model of Coordinated Effort with Application to the Problem of Surveillance C3.
Technical research rept. Oct 78-May 79,
Paul H. Moose, and Don E. Harrison, Jr. May 79, 78p Rept no. NPS-61-79-008
Contract MIPR-DWAM-90002
Availability: Microfiche copies only.

Descriptors: *Cybernetics, *Command and control systems, *Surveillance, Computerized simulation, Markov processes, Entropy, Information processing, Hierarchies, Decision making, Transformations(Mathematics).
Identifiers: Markov chains, Ergodic theory, C3 models.

A two-level surveillance system is modeled using cybernetic techinques. It is shown that if system entropy is used as a measure of system performance, its steady state averagé becomes a sensitive discriminate between alternative control modes, such as between central and local control. It also measures the system's sensitivity to variations in sensor resources, their capabilities and the policy by which they are allocated. It is concluded that informationally derived measures of performance, such as entropy, are appropriate for C3 modeling in many cases that they can prescribe quantitative tradeoffs in a quite general way. (Author)

AD-A071 140/8GA PC **A03**/MF **A01**
Rochester Univ NY Dept of Computer Science
Constraint Networks: Modeling and Inferring Object Locations by Constraints,
Daniel M. Russell. Aug 78, 30p Rept no. TR-38
Contract N00014-78-C-0164

Descriptors: Networks, *Image processing, Pattern recognition, Models, Artificial intelligence, Diagnosis(Medicine).
Identifiers: Constraints.

Relationships between objects in the real world are constrained by many physical and functional considerations. This paper presents a formalism called Constraint Networks which allows such constraints to be represented and used to make inferences about object locations in images. Constraint Networks are used in a system which accepts information about geometric relationships between structures in images and then uses these constraints to guide search for these structures. The system has been used successfully to infer rib positions in a chest X-ray and to locate aeration tanks and new construction sites in aerial images. (Author)

AD-A071 155/6GA PC **A06**/MF **A01**
State Univ of New York at Buffalo Dept of Electrical Engineering
Extrapolation and Spectral Estimation Techniques for Discrete Time Signals.
Phase rept. 17 May-30 Oct 78,
Anil K. Jain, and Surendra Ranganath. May 79, 106p RADC-TR-79-124
Contract F30602-75-C-0122
Prepared in cooperation with California Univ., Davis. Grant DAAG29-78-A-0206.

Descriptors: *Signal processing, *Discrete Fourier transform, *Mathematical filters, Estimates, Interpolation, Power spectra, Iterations, Convergence, Least squares method, Kalman filtering.

This report considers spectral estimation and extrapolation techniques for discrete time, band limited signals, (i.e., signals whose bandwidth is less than 1/T cycles; if T sec. is the sampling interval) which are observable only for a finite duration. The objective is to determine the spectrum (or power spectrum)of these signals. It is shown that the estimated spectrum can be improved considerably (over a periodgram or Maximum entropy spectrum) by first extrapolating the given observations beyond the observation interval. Also, we consider the problem of extrapolation of signal in the presence of noise or other interfering signals. Several new results and algorithms are presented. First, it is shown that some of the existing extrapolation methods for continuous signals when extended to sampled data do not converge to the exact original time-unlimited signal.Rather, one only expects to get a minimum norm least squares estimate. And, we find that Papoulis' 8 iterative extrapolation algorithm is a special case of a gradient algorithm with linear convergence. It is shown that an infinite extrapolation matrix introduced in 10 does not exist and is ill conditioned at best when approximated to a finite matrix. The new extrapolation algorithms include a discrete prolate spheroidal wave function (PSWF) expansion, a conjugate gradient iterative algorithm, a mean square extrapolation filter and recursive Kalman filter type extrapolator.

9E. Subsystems

AD-A070 546/7GA PC **A06**/MF **A01**
Naval Ocean Systems Center San Diego CA
Advanced Mail Systems Scanner Technology. Executive Summary and Appendixes A-D.
Annual rept. no. 4, 10 Oct 77-9 Oct 78,
Frank C. Martin, Thomas R. Little, Lee A. Wise, Joseph M. Greene, and Waldo R. Robinson. Oct 78, 116p Rept no. NOSC/TR-358

Descriptors: *Electronic scanners, *Postal Service, *Optical scanning, Image processing, Charge coupled devices, Photodiodes, Solid state electronics, Data compression, Image intensification, Automatic, COntrol.
Identifiers: Electronic Message Service, Electronic mail.

The objective of the effort described herein is to provide technical consultation, equipment, and support services to the US Postal Service which will contribute to the development of the system definition of a new-concept processing system, the Electronic Message Service (EMS). Included in the scope of effort are investigations of highspeed image scanning technology, image frame memory storage, image enhancement, and the fabrication of a scanner/frame-store memory test assembly. The fourth annual report briefly describes the individual efforts of the reporting period in an executive summary and provides in-depth data in four appendixes: Advanced Illumination Correction; Document Data Base; Paper Reflectance as a Function of Data Density as Seen by a High-Resolution Reflectometer; and Image Capture and Analysis System-System Operator's Manual. (Author)

AD-A070 617/6GA PC **A02**/MF **A01**
Rome Air Development Center Griffiss AFB NY
Dual Frequency Microstrip Disc Antenna Elements.
Station rept.,
Nicholas Kernweis, and John F. McIlvenna. Mar 79, 25p Rept no. RADC-TR-79-74

Descriptors: *Strip transmission lines, *Antenna arrays, *Antenna radiation patterns, *Resonators, Electrical impedance, Standing wave ratios, Bands(Strips), Voltage, X band.
Identifiers: *Microstrip antennas, Disc antennas.

Two radial conducting strips, placed on the edge of a microstrip disc antenna, can be used to produce a dual frequency element. The strip length and circumferential location determine the frequency spread. This report describes a series of experiments that catalog the various effects produced by single and double strips in a variety of circumferential locations. (Author)

AD-A070 652/3GA PC **A02**/MF **A01**
Walter Reed Army Inst of Research Washington DC
Water-Immersed Microwave Antennas and Their Application to Microwave Interrogation of Biological Targets,
John H. Jacobi, Lawrence E. Larsen, and Charles T. Hast. 2 Jun 78, 10p
Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-27 n1 p70-78 Jan 79.

Descriptors: *Microwave antennas, Liquid immersion tests, Measurement, Electromagnetic radiation, S band, Dielectrics, Reprints.

No abstract available.

AD-A070 682/0GA Not available NTIS
Stanford Univ CA Information Systems Lab
Adaptive Noise Cancelling: Principles and Applications,
Bernard Widrow, John R. Glover, Jr., John M. McCool, John Kaunitz, and Charles S. Williams. 24 Mar 75, 25p
Grants NSF-ENGR74-21752, PHS-HL-18307-01
Availability: Pub. in Proceedings of the IEEE, v63 n12 p1692-1716 Dec 75. (No copies furnished by DDC).

Descriptors: *Suppressors, Adaptive systems, Noise reduction, Signal to noise ratio.
Identifiers: Noise cancellation, Notch filters.

No abstract available.

AD-A070 702/6GA PC **A03**/MF **A01**
Varian Associates Inc Palo Alto CA
Noncoplanar High Power FET.
Annual rept. no. 3, Jan-Dec 77,
S. G. Bandy, R. Sankaran, and D. M. Collins. 15 Jan 79, 26p
Contract N00014-75-C-0303

Descriptors: *Transistor amplifiers, *Field effect transistors, Gallium arsenides, High power, Transistors, Titanium, Tungsten, Grooving, Capacitance, Gold, Doping, Cadmium, Substrates, Germanium.
Identifiers: Semiconductor junctions.

By using a p(+) Ge-doped substrate and an MBE active layer, common-gate noncoplanar power FET devices were fabricated. Evaluation revealed that the most serious problem with this run was the poor leakage characteristics of the p-n junction gates. A noncoplanar device run was completed from start to finish for the first time. Cd autodoping in the vee and field growths necessitated going to p(+) Ge-doped substrates, and failure to grow continuous VPE active layers over the vees necessitated going to MBE active layer growth where a sputter clean could be done before growth. It was found that a W-Ti barrier was needed between the ohmic contacts and the overlay metal to preserve

the low contact resistance and overlay conductivity. These first devices suffered from metallization breaks over the mesa edge, a conducting field growth and high gate leakage current. Consequently, no device characteristics were obtained from this run. (Author)

AD-A070 791/9GA PC **A03**/MF **A01**
Illinois Univ at Urbana-Champaign Electromagnetics Lab
An Improved Theory for Microstrip Antennas and Applications. Part I.
Interim rept. no. 1,
Y. T. Lo, W. F. Richards, and D. D. Harrison. May 79, 32p UIEM-78-18-PT-1, UILU-ENG-78-2563-PT-1, RADC-TR-79-111-PT-1
Contract F19628-78-C-0025
See also AD-A070 794.

Descriptors: *Antenna feeds, *Strip transmission lines, *Slot antennas, *Cavity resonators, Q factors, Mathematical models, Equivalent circuits, Polarization, Losses, Copper, Substrates.
Identifiers: *Microstrip antennas, Circular polarization, Disk antennas.

An improvement to a recently reported theory for the analysis of the pattern and impedance loci of microstrip antennas is developed. It yields a theory which is simple and inexpensive to apply. The fields in the interior of the antennnas are characterized in terms of a discrete set of modes. The poles corresponding to these modes are complex and depend on the losses in the antenna. The representation of the fields in terms of these modes in rigorous only for a bona fide cavity with no copper loss. The proper shift in the complex poles due to the addition of copper and radiative losses is approximated by lumping the latter two together with the dielectric loss to form an effective loss tangent. By so doing, it is found that the resulting expressions for impedance of the microstrip antenna is in good agreement with measured results for all modes and feed locations. The theory is applied to the evaluation of impedance variation with feed location, multiport analysis, and to design of circularly polarized microstrip antennas. (Author)

AD-A070 794/3GA PC **A05**/MF **A01**
Illinois Univ at Urbana-Champaign Electromagnetics Lab
An Analysis of the Disk Microstrip Antenna. Part II.
Interim rept. no. 2,
Y. T. Lo, D. D. Harrison, and W. F. Richards. May 79, 97p UIEM-78-19-PT-2, UILU-ENG-78-2564-PT-2, RADC-TR-79-132-PT-2
Contract F19682-78-C-0025
See also AD-A070 791.

Descriptors: *Strip transmission lines, *Cavity resonators, *Antenna arrays, Antenna feeds, Impedance matching, Equivalent circuits, Antenna radiation patterns, Q factors, Electrical impedance, Inductance, Bandwidth.
Identifiers: Disk antennas, *Microstrip antennas, Multiport antennas.

Disk microstrip antennas are treated as cavities, from which both internal and external (radiation) field can be determined, based on an efficient improved theory. This theory can predict the impedance characteristics very accurately even for cases where the dominant mode is not strongly excited. The theory is extended to two-port disk microstrip antennas. In particular, if one port is shorted the input resonant impedance at another port on the circumference can be varied over orders of magnitude by simply changing the relative angular positions between the two ports. In case of a single port a similar variation of input impedance can be achieved by moving the feed in the radial direction. All of these provide a means for impedance matching with practically no effect on the pattern. So far as the input impedance matching is concerned the antenna can be represented accurately by a parallel resonant circuit in series with an inductance. The former derives from the resonant mode term and the latter from all non-resonant terms of the field solution in expansion. Experiments have been conducted to verify the theoretical results. Excellent agreement is observed in all cases. (Author)

AD-A070 847/9GA PC **E08**
Reliability Analysis Center Griffiss AFB NY
Microcircuit Device Reliability. Linear/Interface Data.
1979, 274p Rept no. RAC-MDR-11

Descriptors: *Reliability(Electronics), *Microcircuits, Linear systems, Interfaces, Monolithic structures(Electronics), *Integrated circuits, Modems, Modulators, Analog systems, Digital systems, Life tests, Environmental tests.

This microcircuit device reliability compendium provides failure rate data on linear and interface monolithic microcircuits.

AD-A070 939/4GA PC **A04**/MF **A01**
Guidance Systems Inc Andover MA
Overlapped Sub-Array Scanning Antenna Study.
Final technical rept.,
G. Ploussios. May 79, 70p RADC-TR-79-101
Contract F19628-78-C-0069

Descriptors: *Antenna arrays, *Phased arrays, Multiple beam antennas, Electronic scanners, Radar antennas, Sidelobes, Low level, Overlap, Phase shift circuits, Electronic switches, Matrices(Circuits).

This report refers to an investigation of new phased array techniques using overlapping multiple beam elements. It is shown that this technique, can be applied to a wide variety of electronically scanned system requirements. Two designs, one for limited scan and the other for wide angle scan with a minimum number of elements and phase shifters were selected for the reported computer analysis. The results indicate extremely low sidelobe levels over most of the angular sector while limiting the close-in sidelobes to no more than -20 dB and grating lobe levels to peak values of about -14 dB for some scan locations. The limited scan design utilizes 18 eight-port Butler matrices, 18 phase shifters, and 9 SP2T switches to achieve 20 BW's of a + or - 10 deg. scan. The wide-angle design provides 90 BW's of scan + or - 45 deg.) with 26 eight-port matrix elements, 26 phase shifters and 26 SP4T switches. The analysis of the new scan array technique indicates that the array performance can be further improved at the cost of additional elements and element complexity.

AD-A070 987/3GA PC **A02**/MF **A01**
Rome Air Development Center Hanscom AFB MA Deputy for Electronic Technology
High Throughput CCD Signal Processing Devices,
F. D. Shepherd, Jr. 26 Jun 79, 5p Rept no. RADC/ETR-79-0011
Pub. in Asilomar Conference on Circuit Systems and Components, 6-8 Nov 78.

Descriptors: *Charge coupled devices, Throughput, Broadband, *Signal processing, Dynamic range, Networks, Real time, Delay lines, Reprints.

No abstract available.

AD-A071 149/9GA PC **A02**/MF **A01**
Purdue Univ Lafayette IN Turner Lab for Electroceramics
The Effects of Substrate Composition on Thick Film Circuit Reliability.
Quarterly rept. no. 1, 2 Jan-30 Apr 79,
R. W. Vest. 31 May 79, 22p
Contract N00019-79-C-0240

Descriptors: *Thick films, Resistors, Electrical resistance, Glass, Electrical conductivity, Reaction kinetics, Substrates, Temperature coefficients, Ceramic materials, Ruthenium compounds, Oxides, Circuits, Sintering, Solubility, Annealing, Viscosity, Microstructure, Dissolving.
Identifiers: Aluminum compounds, Silicon compounds, Film resistors, Thick film resistors, Surface tension, *Reliability(Electronics).

The high temperature surface tensions and viscosities of thick film glasses were measured as a funcion of temperature and the amount of AlSiMag 614 substrate dissolved in the glasses. The magnitude of the surface tension was observed to increase and the temperature coefficient of surface tension to decrease as the amount of dissolved substrate was increased. The ripening of RuO2 particles in thick film glasses was measured as a function of temperature and the amount of AlSiMag 614 substrate dissolved in the glasses. The ripening kinetics in all glass compositions were in agreement with a phase boundary reaction rate limiting step, and the rate constant was observed to decrease by a factor of 4 when the amount of dissolved substrate reached 10 weight percent. (Author)

NTIS/PS-79/0870/0GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Aided Design of Microcircuits (Citations from the NTIS Data Base).
Rept. for 1964-Jul 79,
William E. Reed. Sep 79, 162p*
Supersedes NTIS/PS-78/0821, and NTIS/PS-77/0711. For the companion Published Search of the Engineering Index Data Base, see NTIS/PS-79/0871.

Descriptors: *Microelectronics, *Integrated circuits, *Bibliographies, Design, Computerized simulation, Computer graphics, Computer programs, Abstracts.
Identifiers: *Computer aided design.

The bibliography cites Government-sponsored research covering the computer aided design, modeling, layout, and packaging of integrated and other microelectronic circuits. Computer programs and the use of computer graphics are included. (This updated bibliography contains 154 abstracts, 15 of which are new entries to the previous edition.)

NTIS/PS-79/0871/8GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Computer Aided Design of Microcircuits (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 79,
William E. Reed. Sep 79, 253p*
Supersedes NTIS/PS-78/0822, and NTIS/PS-77/0712. For the companion Published Search of the NTIS Data Base, see NTIS/PS-79/0870.

Descriptors: *Microelectronics, *Integrated circuits, *Bibliographies, Design, Computerized simulation, Computer graphics, Computer programs, Abstracts.
Identifiers: *Computer aided design.

The bibliography cites worldwide research reports covering the computer aided design, modeling, layout, and packaging of integrated and other microelectronic circuits. Computer programs and the use of computer graphics are included. (This updated bibliography contains 246 abstracts, 40 of which are new entries to the previous edition.)

N79-28421/2GA PC **A06**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Oscilador de Microondas COM Acoplador Direcional (Microwave Oscillator with a Directional coupler),
M. A. A. Siqueira. Jan 79, 117p INPE-1413-NTE/143
In Portuguese; English Summary.

Descriptors: Couplers, Directional antennas, *Microwave oscillators, Oscillations, Stability, Strip transmission lines.

For abstract, see STAR 1719

N79-28422/0GA PC **A05**/MF **A01**
Cleveland State Univ., OH. Coll. of Engineering.
Error Analysis in the Measurement of Average Power with Application to Switching Controllers.
Final Technical Report, 1 Oct. 1978 - 1 Oct. 1979.
J. E. Maisel. Aug 79, 83p NASA-CR-158847
Grant NSG-3222

Descriptors: *Electric choppers, Electric current, Error analysis, *Frequency multipliers, Voltmeters, Frequency response, Microcomputers, Sine waves, Transfer functions.

For abstract, see STAR 1719

PAT-APPL-6-039 031/GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.

A Scannable Beam-Forming Interferometer Antenna Array System.
Patent Application,
J. A. Kaiser, Jr. Filed 14 May 79, 18p N79-26252/3, NASA-CASE-GSC-12365-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Antenna arrays, *Interferometers, *Signal processing, Fourier analysis, Frequency distribution, *Patent applications, Scanning.
Identifiers: Beam forming.

An antenna array comprising at least three interferometer pairs of antenna elements with selected spacings was made to form a single beam which was readily scannable. All spatial frequencies generated by a signal and intercepted by the array were derived from a signal processing technique applied to the array. The array sampled space in the spatial frequency domain while the signal processing technique utilized real time convolution of functions in the spectral frequency domain. Summation of the appropriate spatial frequencies was equivalent to a Fourier transform operation, yielding the location of the signal source in space. Resolution and freedom from interference of the interferometer system was equal to that of a fully filled array of the same aperture size containing element spacings of one-half wavelength.

PAT-APPL-6-051 269/GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Pasadena Office, CA.
Low Current Linearization of Magnetic Amplifier for DC Transformer.
Patent Application,
S. Nagano. Filed 22 Jun 79, 15p N79-26311/7, NASA-CASE-NPO-14617-1
Contract NAS7-100
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: Low currents, *Magnetic amplifiers, *Transformers, Direct current, Linearization, *Patent applications, Resistors, Saturable reactors, Transducers.

A magnetic amplifier, having two saturable reactor cores with a separate excitation winding on each connected in series opposition, a common control winding, and a common output winding, was adapted for use as a low level signal transducer by exciting the separate excitation windings in push-pull mode through a center tapped transformer. Also, at least one diode in series with a load resistor connected to the output winding was included. A resistor in series with the output winding and load resistor was connected between the center tap of the transformer and the connection between the two excitation windings of the saturable core providing a return current path for the output winding. It also allows the excitation windings of the saturable cores to operate as primary windings of transformers.

PAT-APPL-6-051 276/GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Pasadena Office, CA.
Push-Pull Converter with Energy Saving Circuit for Protecting Switching Transistors from Peak Power Stress.
Patent Application,
W. T. McLyman. Filed 22 Jun 79, 15p N79-26312/5, NASA-CASE-NPO-14316-1
Contract NAS7-100
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Circuit protection, *Switching circuits, Transformers, *Transistors, Voltage converters(Ac to ac), *Voltage converters(Dc to dc), Energy conservation, Energy storage, Inductors, *Patent applications, Push-pull amplifiers, Resistors, Voltage regulators.
Identifiers: *Electric converters.

In a push-pull converter, switching transistors are protected from peak power stresses by a separate snubber circuit in parallel with each comprising a capacitor and an inductor in series, and a diode in parallel with the inductor. The diode is connected to conduct current of the same polarity as the base-emitter junction of the transistor so that energy stored in the capacitor while the transistor is switched off, to protect it against peak power stress, discharges through the inductor when the transistor is turned on, and after the capacitor is discharged the energy now stored in the inductor discharges through the diode. To return this energy to the power supply, or to utilize this energy in some external circuit, the inductor may be replaced by a transformer having its secondary winding connected to the power supply or to the external circuit.

PB-298 607/3GA PC **A03**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Electron Devices Div.
Large Scale Integration Digital Testing - Annotated Bibliography, 1969-1978.
Final rept.,
Thomas F. Leedy. Aug 79, 45p NBS-TN-1102

Descriptors: *Integrated circuits, *Tests, *Bibliographies, Digital techniques, Microcomputers, Computer storage devices.
Identifiers: Large scale integrated circuits.

This annotated bibliography covers articles published in the field of semiconductor device testing. The bibliography contains (1) entries divided into six economics of testing, (2) monolithic circuit testing, (3) the testing of subsystems of large scale integrated circuits such as microcomputer boards and memory arrays, (4) various test strategies used to locate a defective LSI circuit, (5) test equipment available for LSI testing, and (6) various measurement methods that may be of interest to the test engineer.

SAND-78-1523C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Radiation-Tolerant High-Voltage CMOS/MNOS Technology.
G. F. Derbenwick, and W. C. Black, Jr. 1978, 4p CONF-781210-4
Contract EY-76-C-04-0789
IEEE electron devices meeting, Washington, DC, USA, 4 Dec 1978.

Descriptors: *Memory devices, Computers, Fabrication, *Integrated circuits, Radiation hardening, Transistors.
Identifiers: ERDA/420800, ERDA/440200, Complementary metal oxide semiconductors, Metal nitride oxide semiconductors.

For abstract, see ERA citation 04:039338.

SAND-78-8040 PC **A04**/MF **A01**
Sandia Labs., Livermore, CA.
Microprocessor-Controlled, Programmable Ramp Voltage Generator.
J. Hopwood. Nov 78, 55p
Contract EY-76-C-04-0789

Descriptors: *High-voltage pulse generators, *Mass spectrometers, Control equipment, Microprocessors, Pulse shapers.
Identifiers: ERDA/440300, *Sweep generators, Automatic control.

For abstract, see ERA citation 04:027713.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AED-Conf-77-544-002 PC **A03**/MF **A01**
Ehrhardt und Sehmer G.m.b.H., Saarbruecken (Germany, F.R.).
Energy Resources: Shortness or Abundance.
H. Rolshoven. 1977, 30p CONF-771271-2
In German.Congress on the development of energy demand and possibilities of supply, Berlin, F.R. Germany, 5 Dec 1977.
U.S. Sales Only.

Descriptors: *Energy supplies, Comparative evaluations, Energy conservation, Energy demand, Energy policy, Energy sources, Forecasting, German Federal Republic, Global aspects, Gross National Product, Minerals, Profits, Raw materials, Reserves.
Identifiers: ERDA/292000, West Germany.

For abstract, see ERA citation 04:043219.

AED-CONF-77-405-007 PC **A03**/MF **A01**
Karstadt A.G., Essen (Germany, F.R.).
Analyzing the Energy Demand of Air Conditioning and Ventilation Systems in Department Stores.
E. R. Schramek. 1977, 35p CONF-7710159-4
In German.DKV annual meeting, Hannover, F.R. Germany, 6 Oct 1977.
U.S. Sales Only.

Descriptors: *Commercial buildings, Air conditioning, Cost, Electric power, *Energy demand, Experimental data, Graphs, Heating oils, Natural gas, Space heating, Tables.
Identifiers: ERDA/320104, West Germany.

For abstract, see ERA citation 04:043285.

ANL/CES/TE-78-7 PC **A06**/MF **A01**
Oak Ridge National Lab., TN.
Steam Turbines.
J. T. Meador. Oct 78, 110p
Contract W-31-109-ENG-38

Descriptors: Communities, *Ices, *Steam turbines, Cost, Design, District cooling, District heating, Dual-purpose power plants, Efficiency, Energy conservation, Environmental effects, Experimental data, Graphs, Heat, Noise, Performance, Power generation, Rankine cycle, Specifications, Steam generation, Theoretical data.
Identifiers: ERDA/320600, ERDA/290800, Turbogenerators.

For abstract, see ERA citation 04:043339.

ANL/EES-TM-40 PC **A04**/MF **A01**
Argonne National Lab., IL.
Midwestern Energy Supply Issues: A Survey of State Views.
M. L. Hilton, and S. W. Ballou. Sep 78, 53p
Contract W-31-109-ENG-38

Descriptors: *Great Lakes Region, *Midwest Region, North Dakota, South Dakota, Economics, Energy conservation, Energy consumption, Energy demand, *Energy supplies, Environmental policy, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, Regulations, Research programs, USA, Wisconsin.
Identifiers: ERDA/292000, Midwest Region(United States), Great Lakes Region(United States).

For abstract, see ERA citation 04:038909.

ANL/OEPM-78-2 PC **A03**/MF **A01**
Argonne National Lab., IL.
Energy and Cost Calculations. I. Optimization of Electrochemical Processes to Achieve Minimum Product Cost and the Impact on Energy Consumption.
R. Keller. Apr 79, 49p
Contract W-31-109-ENG-38

Descriptors: *Electrochemical cells, *Electrolysis, *Refining, Aluminium, Commodities, Copper, Correlations, Cost, Current density, Economics, Electrochemistry, Energy conservation, Energy consumption, Optimization, Production, Simulation.
Identifiers: ERDA/320303, ERDA/298000, ERDA/291000, Cost analysis.

For abstract, see ERA citation 04:043318.

BETC/IC-79/1 PC **A05**/MF **A01**
Department of Energy, Bartlesville, OK. Bartlesville Energy Technology Center.
Bartlesville Energy Technology Center Publications, January 19, 1975--September 30, 1977.
E. B. Mohr, and M. L. Gudgel. Apr 79, 81p

Descriptors: *Bartlesville Energy Technology Center, *Energy source development, *Bibliographies, US ERDA.
Identifiers: ERDA/990300.

For abstract, see ERA citation 04:044191.

BNL-50890 PC **A06**/MF **A01**
National Center for Analysis of Energy Systems, Upton, NY.

Programmatic Areas for U.S. Assistance for Energy in the Developing Countries.
P. F. Palmedo, R. Nathans, E. Beardsworth, and G. Tschannerl. Dec 78, 118p
Contract EY-76-C-02-0016

Descriptors: *Developing countries, *Federal assistance programs, Economic development, Education, Energy sources, Financing, Renewable energy sources, Sociology, Technology transfer, USA.
Identifiers: ERDA/290200.

For abstract, see ERA citation 04:043176.

CONS-8434-T1 PC **A04**/MF **A01**
Gallup Organization, Inc., Princeton, NJ.
Public's Behavior and Attitudes During the February 1977 Energy Crisis.
Mar 77, 59p
Contract EC-75-C-01-8434

Descriptors: *Energy conservation, *Energy shortages, Residential buildings, Adults, Behavior, Comparative evaluations, Economics, Emergency plan, Fuels, Government policies, Human populations, Implementation, Maintenance, Public opinion, Regional analysis, Retrofitting, Space heating, Tables, Temperature dependence.
Identifiers: ERDA/320900, ERDA/292000, ERDA/291000, Human behavior, Surveys, *Residential sector.

For abstract, see ERA citation 04:036978.

CONS-8434-T2 PC **A03**/MF **A01**
Gallup Organization, Inc., Princeton, NJ.
Public's Behavior and Attitudes During the 1977 Energy Crisis: Survey II. Marginal and Regional Findings for All Questions.
Mar 77, 39p
Contract EC-75-C-01-8434

Descriptors: *Energy conservation, *Energy shortages, Residential buildings, Behavior, Charges, Emergency plan, Fuels, Gasoline, Government policies, Implementation, Public opinion, Regional analysis, Retrofitting, Space heating, Tables, Temperature dependence, Thermal insulation, Weather.
Identifiers: ERDA/320900, ERDA/292000, ERDA/291000, Human behavior, *Residential sector, Surveys.

For abstract, see ERA citation 04:036979.

CONS-8434-T3 PC **A12**/MF **A01**
Gallup Organization, Inc., Princeton, NJ.
Public's Behavior and Attitudes During the 1977 Energy Crisis: Survey II. Appendix: Significant Cross-Tabulations.
May 77, 265p
Contract EC-75-C-01-8434

Descriptors: *Energy conservation, *Energy shortages, Residential buildings, Behavior, Consumption rates, Data compilation, Energy supplies, Gasoline, Government policies, Implementation, Maintenance, Public opinion, Retrofitting, Space heating, Tables, Thermostats.
Identifiers: ERDA/320900, ERDA/292000, ERDA/291000, *Residential sector, Human behavior, Surveys.

For abstract, see ERA citation 04:036980.

CONS-8434-T4 PC **A06**/MF **A01**
Gallup Organization, Inc., Princeton, NJ.
Public's Behavior and Attitudes During the February 1977 Energy Crisis. Appendix: Computer Tabulations.
Mar 77, 122p
Contract EC-75-C-01-8434

Descriptors: *Energy conservation, *Energy shortages, *Residential sector, Behavior, Computers, Data compilation, Emergency plan, Implementation, Public opinion, Space heating, Tables.
Identifiers: ERDA/320900, ERDA/292000, ERDA/291000, Human behavior, Surveys.

For abstract, see ERA citation 04:036981.

COO-4557-1 PC **A02**/MF **A01**
RCA Labs., Princeton, NJ.
Materials for Solar Thermal Conversion. Final Report, September 1, 1977--August, 31, 1978.
J. I. Gittleman, and E. K. Sichel. Sep 78, 21p
PRRL-78-CR-42
Contract EG-77-C-02-4557

Descriptors: *Calcium fluorides, *Composite materials, *Germanium, *Silicon, *Solar absorbers, *Spectrally selective surfaces, Absorptivity, Concentration ratio, Emissivity, Energy gap, Films, Optical properties, Refraction, Semiconductor materials, Spectral reflectance, Sputtering.
Identifiers: ERDA/141000, ERDA/360601, Solar energy conversion, Semiconductors, Materials.

For abstract, see ERA citation 04:044627.

DOE/EIA-0102/46 PC **A02**/MF **A01**
Energy Information Administration, Dallas, TX.
Regional Residential Sector Energy Price Forecasts for 1978: Electricity, Natural Gas, Number 2 Fuel Oil, and Propane.
P. DonVito, and H. Walton. Mar 79, 20p

Descriptors: *Electric power, *Fuel oils, *Heating oils, *Natural gas, *Residential sector, Charges, Cost, *Energy supplies, Forecasting, Propane, Regional analysis, USA.
Identifiers: ERDA/292000, ERDA/320101, ERDA/290200, ERDA/030600, ERDA/020500, *Prices.

For abstract, see ERA citation 04:036665.

DOE/EIA-0102/50 PC **A02**/MF **A01**
Energy Information Administration, Washington, DC.
Residential Sector Energy Forecasts, National Level for 1978-Electricity, Natural Gas, Number Two Fuel Oil and Propane.
P. DonVito, and H. Walton. Mar 79, 23p

Descriptors: *Electric power, *Heating oils, *Natural gas, *Propane, *Residential sector, Data compilation, Forecasting, Fuels, *Prices, Tables.
Identifiers: ERDA/320101, ERDA/020500, ERDA/296000, ERDA/294002, ERDA/294003, *Energy supplies.

For abstract, see ERA citation 04:043271.

DOE/EIA-0102/52 PC **A10**/MF **A01**
Energy Information Administration, Washington, DC.
Energy Supply and Demand in the Midterm: 1985, 1990, and 1995. Analysis Report.
Apr 79, 223p

Descriptors: *Energy demand, *Energy supplies, USA, Computer simulation, Efficiency, Energy consumption, Energy models, Forecasting, Market.
Identifiers: ERDA/292000.

For abstract, see ERA citation 04:041086.

DOE/EIA-0103/30 PC **A03**/MF **A01**
Energy Information Administration, Washington, DC.
Natural Gas Supply/Demand Accounting.
C. Everett, and W. Trapmann. 27 Feb 79, 28p

Descriptors: *Natural gas, Accounting, Data compilation, Demand factors, Energy demand, Experimental data, Supply and demand.
Identifiers: ERDA/030600, ERDA/294003, Energy accounting.

For abstract, see ERA citation 04:042328.

DOE/EIA-0135 PC **A06**/MF **A01**
Department of Energy, Washington, DC. Energy Information Administration.
Energy Emergency Management Information System (EEMIS): Program Plan.
Mar 79, 123p

Descriptors: *Energy management, *Energy supplies, Decision making, Emergency plan, Fossil fuels, Information systems, Planning, US DOE.
Identifiers: ERDA/292000, ERDA/293000, ERDA/990300.

For abstract, see ERA citation 04:038910.

DOE/EIA-0149 PC **A04**/MF **A01**
Energy Information Administration, Washington, DC.
EIA Publications Directory.
D. L. Noble. Jan 79, 70p

Descriptors: *Energy sources, *Energy supplies, US DOE, Data, Energy demand, Energy models, Information, Maps, PIES.
Identifiers: ERDA/290000, Listings.

For abstract, see ERA citation 04:041007.

DOE/EIA-0176/1 PC **A03**/MF **A01**
Energy Information Administration, Washington, DC.
Distributional Aspects of Standby Gasoline Rationing Plan.
G. E. Peabody, and E. Reiser. 12 Apr 79, 31p

Descriptors: *Gasoline, *Allocations, Data compilation, Distribution, Human populations, Income, Income distribution, Simulation, USA, Vehicles.
Identifiers: ERDA/021000, ERDA/294002, ERDA/293000, Households, Motor vehicles, Energy conservation.

For abstract, see ERA citation 04:042311.

DOE/ET-0086 PC **A11**/MF **A01**
Department of Energy, Washington, DC. Office of Energy Technology.
EMaCC: FY-1978 Topical Area Report.
Apr 79, 242p

Descriptors: *Energy sources, Cements, Concretes, Elastomers, Energy storage, Fossil fuels, Geothermal energy, Materials, Radiation effects, Research programs, Solar energy, Superconductors.
Identifiers: ERDA/360000.

For abstract, see ERA citation 04:043380.

DOE/IR-0041 PC **A07**/MF **A01**
Department of Energy, Washington, DC. Office of Consumer Affairs.
Energy and Food. Official Transcript of Public Briefing and Addendum, May 25, 1978, Washington, D.C.
Feb 79, 146p

Descriptors: *Energy, *Food, Food industry, Government policies, Management, *Meetings, Public opinion.
Identifiers: ERDA/292000, ERDA/553000, ERDA/290400, National government.

For abstract, see ERA citation 04:036666.

DOE/TIC-10001 PC **A19**/MF **A01**
Department of Energy, Denver, CO. Region VIII.
Regional Profile, Energy-Impacted Communities: Regional VIII.
Mar 79, 434p

Descriptors: Colorado, *Energy source development, Montana, North dakota, South Dakota, Utah, Wyoming, Communities, Data compilation, Economic impact, Education, Energy conversion, Environmental impacts, Financing, Houses, Human populations, Population dynamics, Public health, Rocky Mountain Region, Safety, Sewage, Social impact, Tables, Water resources.
Identifiers: ERDA/530100, ERDA/530200, ERDA/294000, *Rocky Mountain Region(United States).

For abstract, see ERA citation 04:041706.

DOE/TIC-10062 PC **A02**/MF **A01**
Department of Energy, Washington, DC. Office of Conservation and Solar Applications.
Managerial Plan: Executive Order 12003 and the National Energy Act (Proposed). Synopsis.
Sep 78, 18p
Contract EM-77-C-01-8962

Descriptors: *Energy conservation, *Energy management, *Energy Policy and Conservation Act, *Federal buildings, *National Energy Act, *National Energy Plan, Building codes, Building materials, Compliance, Energy efficiency, *Government policies, Operation, Regulations, Standards, US DOE, US HUD.
Identifiers: ERDA/291000, ERDA/293000, ERDA/320102, ERDA/320103, National government, *Energy policy.

For abstract, see ERA citation 04:038899.

DOE/TIC-10064 PC **A04**/MF **A01**
Unified Industries, Inc., Alexandria, VA.
Analysis and Update of Roles and Responsibilities Derived from Executive Order 12003 and Related Authorities.
31 Oct 78, 51p
Contract EM-77-C-01-8962

Descriptors: *Energy conservation, *Energy management, *Energy Policy and Conservation Act, *Federal buildings, *National Energy Act, Building codes, Building materials, Compliance, Government policies, Operation, Regulations, Standards, US DOE.
Identifiers: ERDA/320102, ERDA/320103, ERDA/291000, ERDA/293000, Department of Energy, National government.

For abstract, see ERA citation 04:039008.

DOE/TIC-10065 PC **A04**/MF **A01**
Department of Energy, Washington, DC.
Briefings Related to Executive Order 12003 and the National Energy Act.
Nov 78, 63p
Contract EM-77-C-01-8962

Descriptors: *Energy conservation, *Energy management, *Energy Policy and Conservation Act, *Federal buildings, *National Energy Act, Building codes, Building materials, Compliance, Education, *Government policies, Lighting systems, Regulations, Retrofitting, Reviews, Space heating, Standards, Thermostats, US DOE, US HUD.
Identifiers: ERDA/291000, ERDA/293000, ERDA/320102, ERDA/320103, National government, *Energy policy.

For abstract, see ERA citation 04:038900.

DOE/TIC-10066 PC **A02**/MF **A01**
Unified Industries, Inc., Alexandria, VA.
Recommended Changes to Executive Order 12003 and Related Authorities.
27 Oct 78, 9p
Contract EM-77-C-01-8962

Descriptors: *Energy conservation, *Energy management, *Energy Policy and Conservation Act, *Federal buildings, *National Energy Act, Building materials, Compliance, *Government policies, Leasing, Lighting systems, Operation, Recommendations, Regulations, Retrofitting, Space heating, Standards, Thermostats.
Identifiers: ERDA/291000, ERDA/293000, ERDA/320102, ERDA/320103, *Energy policy, National government.

For abstract, see ERA citation 04:038901.

DOE/TIC-10068 PC **A05**/MF **A01**
Executive Office of the President, Washington, DC. Energy Policy and Planning.
Report of the Written Responses on National Energy Policy.
May 77, 98p

Descriptors: *Energy policy, *National Energy Plan, Data compilation, Economic impact, Energy conservation, Energy source development, Energy supplies, Environment, Evaluation, Government policies, Imports, Public opinion, Recommendations, Regulations, Tables.
Identifiers: ERDA/293000, National government.

For abstract, see ERA citation 04:036682.

DOE/TIC-10108 PC **A06**/MF **A01**
Florida Univ., Gainesville.
Historic and Current Energy Analysis of Florida.
N. G. Sipe. 1978, 105p
Contract EY-76-S-05-4398
Thesis.

Descriptors: *Florida, American Indians, Commodities, Consumption rates, Economic analysis, Economic growth, Electric power, *Energy analysis, Energy consumption, Energy models, Energy supplies, Exports, Fuel substitution, Graphs, Imports, Land use, Leisure time activities, Net energy, Population dynamics, Regulations, Renewable energy sources, Reviews.
Identifiers: ERDA/290100, ERDA/290200.

For abstract, see ERA citation 04:038861.

DOE/TIC-10109 PC **A16**/MF **A01**
Department of Energy, Washington, DC.
National Energy Plan II.
1979, 355p

Descriptors: *Energy policy, *National Energy Plan, Data compilation, Decision making, Efficiency, Emergency plan, Forecasting, Reviews, USA.
Identifiers: ERDA/293000, Government policies, National government.

For abstract, see ERA citation 04:041097.

EPRI-ER-979 PC **A06**/MF **A01**
Booz, Allen and Hamilton, Inc., Bethesda, MD.
EPRI New Energy Resources Department Strategy Paper. Final Report; January 1979.
M. Lotker. 1979, 114p

Descriptors: *EPRI, Geothermal energy, *Renewable energy sources, Solar energy, Thermonuclear reactions, Demand factors, Electric utilities, Energy source development, Energy sources, Financing, Planning, Research programs, Technology assessment.
Identifiers: ERDA/299000, ERDA/290600, ERDA/140100, ERDA/150100, *Project planning.

For abstract, see ERA citation 04:041116.

HCP/M-2165 PC **A06**/MF **A01**
League of Women Voters Education Fund, Washington, DC.
Energy Conservation Technology Education Program. Final Report.
Jan 79, 106p
Contract EC-77-C-01-2165

Descriptors: *Energy conservation, Residential buildings, Arizona, Connecticut, *Education, Energy efficiency, Energy shortages, Houses, Minnesota, North Carolina, Public opinion, Technology assessment.
Identifiers: ERDA/291000, ERDA/320101, ERDA/320900, *Residential sector.

For abstract, see ERA citation 04:038902.

LA-UR-79-673 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Potential Prediction Needs in Support of Energy Systems.
R. L. Blake. 1979, 7p CONF-790413-3
Contract W-7405-ENG-36
International solar-terrestrial predictions workshop, Boulder, CO, USA, 23 Apr 1979.

Descriptors: *Solar radiation, Climates, Earth atmosphere, Energy demand, Environment, Environmental effects, Forecasting, Global aspects, Information needs, Ionosphere, Solar energy.
Identifiers: ERDA/140100, ERDA/299001, ERDA/292000.

For abstract, see ERA citation 04:040507.

LA-7573-PR PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Systems, Analysis, and Assessment. Progress Report, July--September 1978.
E. A. Ronquillo. Dec 78, 31p
Contract W-7405-ENG-36

Descriptors: *Energy analysis, *Statistics, Economics, LASL, Research programs, Socio-economic factors, Systems analysis.
Identifiers: ERDA/530100.

For abstract, see ERA citation 04:027953.

LA-7772-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Sensitivity Analysis of Large Computer Models: A Case Study of the COAL2 National Energy Model.
A. Ford, G. H. Moore, and M. D. McKay. Apr 79, 40p
Contract W-7405-ENG-36

Descriptors: *Energy models, *Mathematical models, Computer calculations, Energy consumption, Energy sources, Forecasting, Sensitivity analysis.
Identifiers: ERDA/290100, ERDA/990200, COAL2 National Energy Model.

For abstract, see ERA citation 04:044882.

LBL-7872 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Energy Use and Conservation in Industrialized Countries.
L. Schipper. Nov 78, 46p CONF-781124-1
Contract W-7405-ENG-48
Conference on Energy Productivity, New York, NY, USA, 2 Nov 1978.

Descriptors: *Developed countries, Energy conservation, Comparative evaluations, Cost, Efficiency, Energy analysis, *Energy consumption, Energy policy, Financial incentives, Forecasting, Global aspects, Graphs, Gross National Product, Life styles, Standard of living, Sweden, Tables, Taxes, USA.
Identifiers: ERDA/298000, ERDA/291000.

For abstract, see ERA citation 04:036727.

LBL-7882 PC **A05**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Energy Conservation and the Environment: Conflict or Complement.
L. Schipper. Sep 78, 84p CONF-7809141-1, CONF-7810167-1
Contract W-7405-ENG-48
Conference on impacts and risks of energy strategies, Stockholm, Sweden, Sep 1978.

Descriptors: *Energy conservation, *Environment, Correlations, Economics, Energy efficiency, Energy policy, Evaluation, Government policies, Meetings, Risk assessment.
Identifiers: ERDA/291000, ERDA/290300.

For abstract, see ERA citation 04:041054.

LBL-7893 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Another Look at Energy Conservation.
L. Schipper. 1978, 24p CONF-7808104-1
Contract W-7405-ENG-48
American Economic Association meeting, Chicago, IL, USA, 30 Aug 1978.

Descriptors: *Buildings, *Industry, *Transportation sector, USA, Economics, Energy conservation, Energy policy, Energy supplies.
Identifiers: ERDA/320000, ERDA/291000.

For abstract, see ERA citation 04:041132.

LBL-8296 PC **A05**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Proceedings of the Hawaii Inventors' Conference.
1978, 76p CONF-780384-
Contract W-7405-ENG-48
Hawaii inventors conference, Iliki, HI, USA, 31 Mar 1978.

Descriptors: Hawaii, *Technology transfer, Appropriate technology, Energy supplies, Information, *Meetings, Patents, Research programs.
Identifiers: ERDA/290500.

For abstract, see ERA citation 04:041038.

LBL-9139 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Inventory of Energy Conservation Potential in California: The Cement Industry.
P. Kuhn, K. Hudson, C. Blumstein, and C. York. Apr 79, 46p
Contract W-7405-ENG-48

Descriptors: California, *Cement industry, Co-generation, *Energy conservation, Energy consumption, Evaluation, Fuel substitution, Grinding, Institutional factors, Inventories, Kilns.
Identifiers: ERDA/320303, ERDA/291000, Industries.

For abstract, see ERA citation 04:043321.

MLM-2549(OP) PC **A02**/MF **A01**
Mound Facility, Miamisburg, OH.
Chemical and Optical Studies of Heat Transfer Fluids Containing Solar Energy Absorbers.
A. R. Burke, C. R. Hudgens, and L. J. Wittenberg. 1978, 13p CONF-790405-4
Contract EY-76-C-04-0053
AICE meeting, Houston, TX, USA, 1 Apr 1979.

Descriptors: Dyes, *Heat transfer fluids, Absorptivity, Ambient temperature, Aqueous solutions, Boil-

ing points, Opacity, Solar absorbers, Stability, Temperature effects, Testing, Thermal cycling.
Identifiers: ERDA/140901.

For abstract, see ERA citation 04:025973.

ORNL/SUB-79/42532 PC **A07**/MF **A01**
Westinghouse Electric Corp., Pittsburgh, PA. Advanced Energy Systems Div.
Applications of Thermal Energy Storage to Waste Heat Recovery in the Food Processing Industry. Final Report.
W. L. Lundberg, and J. A. Christenson. Jul 79, 146p
Contract W-7405-ENG-26

Descriptors: *Food industry, Heat recovery equipment, Economics, *Energy conservation, Food processing, Performance, Waste heat, *Waste heat utilization.
Identifiers: ERDA/320304, *Heat recovery, Industries.

For abstract, see ERA citation 04:045016.

ORNL/TM-6913 PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Decentralized Solar Energy Technology Assessment Program: Research Plan.
B. H. Bronfman, M. Schweitzer, S. A. Carnes, E. Peelle, and G. Samuels, Jr. May 79, 53p
Contract W-7405-ENG-26

Descriptors: *Solar energy, Communities, Economic impact, Government policies, Legal aspects, Life styles, Social impact, Technology assessment.
Identifiers: ERDA/140400, ERDA/299001.

For abstract, see ERA citation 04:040512.

PB-297 360/0GA PC **A02**/MF **A01**
Northeastern Legislative Leaders Energy Project, Albany, NY.
Policy Options for Energy Conservation (82), a Checklist of Legislation to Conserve Energy Prepared for Consideration of Legislation Leaders of the Northeast.
1977, 6p NSF/RA-770837

Descriptors: Buildings, Households, Fuel consumption, Legislation.
Identifiers: *Energy conservation, Industrial sector, Residential sector, Northeast Region(United States).

This checklist of legislation contains policy options for the conservation of energy in the Northeast. The 82 recommendations were made for conservation in the following areas: (1) saving energy in all buildings; (2) saving energy in residential construction; (3) saving energy in commercial and industrial buildings; (4) saving energy by reducing gasoline consumption; (5) saving energy in government operations; and (6) saving energy in commercial and industrial processes.

PB-297 527/4GA PC **A05**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Petroleum Pipeline Rates and Competition--Issues Long Neglected by Federal Regulators and in Need of Attention.
Report to the Congress.
13 Jul 79, 88p* EMD-79-31

Descriptors: *Petroleum pipelines, Regulations, Government policies, National government, Legislation, Rates(Costs), Profits, Competition, Recommendations.

This report discusses the lack of effective Federal regulation of oil pipelines and suggests ways to improve such activities.

PB-297 531/6GA PC **A12**/MF **A01**
General Accounting Office, Washington, DC. Energy and Minerals Div.
Issues Facing the Future of Federal Coal Leasing.
Report to the Congress.
25 Jun 79, 266p* EMD-79-47

Descriptors: *Coal, *Leasing, Acquisition, Management, Legislation, Government policies, National government, Recommendations.
Identifiers: Energy source development, *Western coal, Legal aspects.

This report brings to the attention of the Congress and the Administration issues which have or may have significant adverse effects on the development and implementation of a sound Federal coal management program and the use of Federal and non-Federal Western coal in meeting America's energy needs. Its basic purpose is to provide a framework for understanding the broad range of coal leasing issues by identifying and sorting out the more significant questions which face the future of coal on Federal lands.

PB-297 545/6GA PC **A04**/MF **A01**
Northeastern Legislative Leaders Energy Project, Albany, NY.
Northeastern Legislative Leaders Energy Project, 1978.
Final rept. Jun 75-Jun 78,
Albert J. Abrams. 1978, 68p NSF/RA-780607
Grant NSF-ISP75-15817
See also report dated Nov 75, PB-248 997.

Descriptors: *Regional planning, *Energy, Legislation, Project planning, Meetings, State government.
Identifiers: Energy policy, Northeast Region(United States), New England, Northeastern Legislative Leaders Energy Project.

The nature and activities of the Northeastern Legislative Leaders Energy Project (NELLEP) during the past three years is reported. Project accomplishments are described and the impact of the project is assessed. The accomplishments are grouped and discussed in detail under these fundamental categories: Promotion of Interstate Legislative Science and Technology Communication; Regional Alternatives; Northeastern Energy Trade-Offs; Regional Effectiveness; State Legislative Effectiveness; Project Utilization; Problems and Personnel Changes. Included in the appendices are: NELLEP information sources; organizational affiliations; participation in meetings; seminars and conferences; and relations with the coalition of Northeast governors.

PB-297 586/0GA PC **A02**/MF **A01**
Environmental Protection Agency, Ann Arbor, MI. Standards Development and Support Branch.
Fuel Economy Effects of Tires.
Technical rept.,
Glenn Thompson. Feb 78, 13p SDSB-79/13

Descriptors: *Automobile tires, Fuel consumption, Highway transportation, Motor vehicles, Tires.
Identifiers: *Fuel economy, Radial tires, Radial ply tires, Energy conservation.

Tires have a very significant effect on the fuel economy of a vehicle. The best known example of this is the fuel efficiency of radial tires; however, other tire technologies and related factors can also be important. This report discusses the effects of various types of tires and tire related parameters on the fuel economy of a vehicle.

PB-297 596/9GA PC **A03**/MF **A01**
Northeastern Legislative Energy Staff, Albany, NY.
The Question is...An Energy Notebook for State Legislators,
Albert J. Abrams. 1976, 40p NSF/RA-760114

Descriptors: *Energy, *Environmental impacts, *Handbooks, Public health, Safety, Accident prevention, Public utilities, Electric utilities, Oil burners, Coal mining, Building codes, Solar energy, Wind power generation, Hydroelectric power generation, Air pollution control, Water pollution control, Recycling, Ozonization, Liquefied natural gas, Rates(Costs).
Identifiers: Northeast Region(United States), Energy conservation, Gasohol.

This booklet, composed of responses to energy questions and related concerns, is designed to help legislative leaders in the Northeast answer questions from their constituents. The report includes quick one-page responses to typical questions which are separated into categories of energy, environment, and health and safety. Examples of energy inquiries involve utility rate policies, oil burner choices. coal mining expertise, building codes, energy conservation, gasohol, and solar, wind, and hydroelectric energy. Inquiries in environment include emission control enforcement, coastal protection, pollution control funding, metal cans, plastic containers, and ozone depletion. Problems involving effects of sulfur pollutants and the transfer of liquid natural gas are considered in health and safety.

PB-297 687/6GA PC **A03**/MF **A01**
George Washington Univ., Washington, DC. Program of Policy Studies in Science and Technology.
Phases in the Deployment of Offshore Wind Energy Conversion Systems (WECS) Configurations to Legal-Institutional Implications of Wind Energy Conversion Systems. Appendix A.
Mar 77, 49p NSF/RA-770709
Grant NSF-APR75-19137
See also report dated Sep 77, PB-273 006.Portions of this document are not fully legible.

Descriptors: *Wind power generation, Legislation, Site surveys, Planning.
Identifiers: Offshore sites, Legal aspects, Offshore platforms.

The basic sequence of functions and actions which will be or may be involved in the deployment of an offshore wind energy conversion system (WECS) installation is presented. Certain project configurations are posited in order to examine on a provisional basis the types of legal-institutional issues which might arise in the process of installation. These basic WECS configurations are: (1) fixed platform units within the three-mile limit; (2) artificial island or extended land fill within the three-mile limit; (3) fixed platform on the Outer Continental Shelf (OCS) beyond the three-mile limit; (4) artificial island on the OCS beyond the three-mile limit; (5) moored units on the OCS or out to the proposed 200-mile 'economic zone'; and (6) moored units beyond the outer limits of the OCS or beyond the proposed 'economic zone'.

PB-297 722/1GA PC **A16**/MF **A01**
Peat, Marwick, Mitchell and Co., Anchorage, AK.
Alaska OCS Socioeconomic Studies Program. Technical Report Number 34. Northern Gulf of Alaska Petroleum Development Scenarios: Economic and Demographic Impacts.
Final rept.
Jun 79, 367p TR-34, BLM/YK-TR-79/09
Contract DI-AA550-CT6-61
Prepared by Alaska Univ., Anchorage. Inst. of Social and Economic Research.

Descriptors: *Alaska Gulf, Economic impact, Social effect, Demography, Population growth, Scenarios, Forecasting, Alaska.
Identifiers: *Energy source development, *Petroleum, Offshore sites.

This report contains an analysis of the historic growth of the Alaskan economy. It describes not only the change in the magnitude of growth but also the structural change experienced between 1965 and 1976. The report also uses a model of the Alaskan economy, developed in the Man in the Arctic Program by the Institute of Social and Economic Research, to project the economic, fiscal, and population effects of three alternative OCS scenarios. The impacts of each of these scenarios are described in terms of the change in aggregate indicators, the structure of the economy, and the impact on the state's fiscal position.

PB-297 729/6GA PC **A08**/MF **A01**
California Joint Committee on Energy Policy and Implementation, Sacramento.
Energy Administration and Regulation in California: An Analysis.
Mar 79, 163p

Descriptors: *Electric power, *Regional planning, Electric utilities, Forecasting, Conservation, Substitutes, Site surveys, Planning, California.
Identifiers: Energy policy, Warren-Alquist Act.

This report sets forth an analysis and recommendations concerning alternatives for reorganization of the State Energy Resources Conservation and Development Commission and is intended to provide a basis for the Joint Committee's recommendations to the legislature on the reorganization of the state's energy-related functions.

PB-297 748/6GA PC **A04**/MF **A01**
Northeastern Legislative Leaders Energy Project, Albany, NY.
Northeastern Legislative Leaders Energy Project, Annual Report,
Albert J. Abrams. Oct 77, 52p NSF/RA-770279
Grant NSF-ISP74-43894

Descriptors: Decision making, State government, Government policies.
Identifiers: *Energy management, Energy policy, Northeastern Legislative Leaders Energy Project.

The Northeastern Legislative Leaders Energy Project (NLLEP) is a unique experiment in regional legislative cooperation. An Executive Board composed of the state legislative leadership of Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont provides guidance and direction for project activities. This report describes the nature and activities of the Northeastern Legislative Leaders Energy Project (NLLEP). Accomplishments are grouped under six functional categories: promotion of interstate legislative science and technology communication; provision of scientific and technological assistance to participating state legislatures on energy policy matters; liaison with federal government entities responsible for energy policy development and implementation; pursuit of regional alternatives to the present fragmented structure of energy-related decision making; exploration of possible energy, environmental and economic trade-offs between and among the Northeastern States; and assessment of the impact and potential of national energy programs for the Northeastern States.

PB-297 860/9GA PC **A03**/MF **A01**
Volunteers in Technical Assistance, Inc., Mt. Rainier, MD.
Alternative Energy Technologies in Brazil,
J. M. F. Miccolis. Feb 77, 31p
Sponsored in part by Agency for International Development, Washington, DC. Office of Science and Technology.

Descriptors: *Brazil, Solar energy, Fuels, Ethyl alcohol, Charcoal, Wood, Hydrogen, Shale oil, Reviewing.
Identifiers: *Energy source development, Ocean Thermal energy conversion, Bioconversion, Hydrogen economy, Energy conservation.

The possibilities for developing alternative energy technologies in Brazil are many and varied. Some of them are peculiar to the country; others are applicable elsewhere. This report outlines many possibilities, such as solar energy, water power, and bio-conversion of waste and concludes that a very well-coordinated and executed comprehensive approach toward the problem will be required.

PB-297 866/6GA PC **A08**/MF **A01**
Dakar Univ. (Senegal).
L'Energie Solaire, Sur Les Energies Nouvelles (Solar Energy, about New Energies),
Malu Wa Kalenga, and Isengingo Kambere Ng'Ise. 20 Jan 79, 156p
Text in French. Sponsored in part by Agency for International Development, Washington, DC.

Descriptors: *Solar energy, Solar cells, Photosynthesis, Pumping, Insolation, Heating, Zaire, Senegal, Niger, Ivory Coast.
Identifiers: Developing country application, Geothermal energy, Wave power.

The uses of solar energy are extensively covered in this highly technical, thorough treatise. Geothermal energy and energy of the waves are briefly examined as other possible renewable, universal, clean sources of energy. Physical, thermodynamic and quantum-chemical properties are analyzed and applied to various transformations: (1) Electrical transformations and industrial applications (photo-electric cell, photo-voltage cell, semiconductor). Se, Si and Ge are examined as sources of photosensitive semiconductors. (2) Transfer to chemical energy (photochemical preparation of chemicals, electrolyses of water using photosensitive semiconductors). Photo-synthesis is extensively treated as a source of both food and fuel (Combustion, pyrolysis, aerobic- and anaerobic fermentation). In the second part of the book solar energy is applied in Zaire in a program to: (1) Measure the amount of solar energy at 12 different stations. Results per station are reported, using graphs. (2) Attempts to receive T.V. (3) Attempts to transmit T.V. (4) Attempts to pump water. (5) To heat. Future programs for Zaire, Senegal, Niger and the Ivory Coast are listed. Other countries that have shown an interest in solar energy are briefly listed.

PNL-2953 PC **A03**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Plastics Honeycomb Core Solar Coverplate.
N. R. Gordon. Mar 79, 32p
Contract EY-76-C-06-1830

Descriptors: *Solar collectors, Coverings, Economic analysis, Efficiency, Fabrication, *Honeycomb structures, Light transmission, Materials testing, Performance testing, Plastics, Weathering.
Identifiers: ERDA/141000.

For abstract, see ERA citation 04:044628.

PNL-2963 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Preliminary Review of NECPA Generated Information Requirements for the Office of Conservation and Solar Applications.
R. G. Rivera, and A. L. Nieves. 8 Mar 79, 64p
Contract EY-76-C-06-1830

Descriptors: *Energy conservation, *National Energy Act, Commercial sector, Communications, Data, Data acquisition, Federal buildings, Implementation, Industry, Information, Information needs, Public buildings, Public utilities, Residential sector, Tables, Transportation systems.
Identifiers: ERDA/291000.

For abstract, see ERA citation 04:043213.

RAND/R-2278-DWP/NSF PC **A06**/MF **A01**
RAND Corp., Santa Monica, CA.
Los Angeles Senior Citizen Lifeline Electricity Rates.
T. J. Sullivan. Jan 79, 105p
Contract EM-75-F-01-8073

Descriptors: *Elderly people, *Electric utilities, *Rate structure, Charges, Efficiency, Electric power, Energy consumption, Los Angeles, Low income groups, Socio-economic factors.
Identifiers: ERDA/296000, ERDA/320900, Elderly persons.

For abstract, see ERA citation 04:038932.

SAN-1439-8 PC **A03**/MF **A01**
Institute of Gas Technology, Chicago, IL.
Analysis of Advanced Conceptual Designs for Single-Family-Size Absorption Chillers. Project 9101 Semi-Annual Technical Status Report, September 1, 1977--March 31, 1978.
R. A. Macriss, T. S. Zawacki, M. T. Kouo, and J. T. Cole. Sep 78, 33p
Contract EG-77-C-03-1439

Descriptors: *Adsorbents, *Refrigerants, *Solar cooling systems, Absorption refrigeration cycle, Crystallization, Data compilation, Mixing heat, Solubility.
Identifiers: ERDA/140901, ERDA/360602.

For abstract, see ERA citation 04:044575.

SAND-78-0898C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Apparent Absorptance of Cylindrical Enclosures.
J. C. Dunn. Apr 78, 6p CONF-781133-1
Contract EY-76-C-04-0789
AIAA conference on solar energy, Phoenix, AZ, USA, 27 Nov 1978.

Descriptors: *Solar absorbers, Absorptivity, Apertures, Cylindrical configuration, Design, Efficiency, Emissivity, Geometry, Heat losses, Solar collectors, Surfaces.
Identifiers: ERDA/141000.

For abstract, see ERA citation 04:029702.

SAND-78-1851C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Efforts on the Economic Analysis of Darrieus Vertical Axis Wind Turbines.
W. N. Sullivan. 1978, 8p CONF-780972-1
Contract EY-76-C-04-0789
American Wind Energy Association Conference, Hyannis, MA, USA, 25 Sep 1978.

Descriptors: *Darrieus rotors, *Wind power plants, Cost, Design, Economics, Feasibility studies, Mathematical models, Specifications.
Identifiers: ERDA/170400.

For abstract, see ERA citation 04:026165.

SAND-79-0215C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Structural Optimization of Sheet Molding Compound Line Focusing Collectors.
R. C. Reuter, Jr., and R. E. Allred. 1979, 6p
CONF-790517-1
Contract EY-76-C-04-0789
24. annual SAMPE symposium, San Francisco, CA, USA, 8 May 1979.

Descriptors: *Parabolic trough collectors, Cost, Fabrication, Materials, Mechanical structures, Optimization, Specifications, Supports.
Identifiers: ERDA/141000, Solar collectors, Concentrating collectors.

For abstract, see ERA citation 04:040569.

SAND-79-0418 PC **A06**/MF **A01**
Sandia Labs., Albuquerque, NM.
Graphical Representation of TMY Solar Radiation Availability for One- and Two-Axis Solar Collectors.
L. L. Lukens, and R. R. Peters. May 79, 113p
Contract EY-76-C-04-0789

Descriptors: *Insolation, Availability, Concentrating collectors, Efficiency, Solar radiation, Solar tracking.
Identifiers: ERDA/140100, Solar collectors.

For abstract, see ERA citation 04:042541.

SAND-79-0697C PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Heliostat Beam Characterization System.
E. D. Thalhammer, and G. S. Phipps. 1979, 37p
CONF-790505-10
Contract EY-76-C-04-0789
25. ISA international instrumentation symposium, Anaheim, CA, USA, 7 May 1979.

Descriptors: *Heliostats, *Tower focus power plants, Calibration, Central receivers, Evaluation, Performance, Vidicons.
Identifiers: ERDA/140702.

For abstract, see ERA citation 04:040549.

SERI/TP-51-158 PC **A02**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Status of Information for Consumers of Small Wind Energy Systems.
P. Weis. Feb 79, 19p CONF-781235-3
Contract EG-77-C-01-4042
Symposium on commercialization of solar and conservation technologies, Miami Beach, FL, USA, 11 Dec 1978.

Descriptors: *Wind power, *Wind turbines, Availability, Economics, Feasibility studies, Power generation, Site selection.
Identifiers: ERDA/170400, ERDA/170604, ERDA/170100, ERDA/299003.

For abstract, see ERA citation 04:038563.

SERI/TR-51-160 PC **A04**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Implementation of State Solar Incentives: Financial Programs.
J. Ashworth. Feb 79, 64p
Contract EG-77-C-01-4042

Descriptors: *Solar energy, Evaluation, *Financial incentives, *Financing, Government policies, Implementation, Information, Installation, Legal aspects, USA.
Identifiers: ERDA/140300, ERDA/299001, State government.

For abstract, see ERA citation 04:038361.

SERI/TR-51-161 PC **A03**/MF **A01**
Solar Energy Research Inst., Golden, CO.

Implementation of State Solar Incentives: Research, Development, and Demonstration Programs.
B. Green. Feb 79, 41p
Contract EG-77-C-01-4042

Descriptors: *Solar energy, California, Commercialization, Design, Evaluation, Financial incentives, Financing, Florida, Government policies, Implementation, Montana, New Mexico, Political aspects, Recommendations, Research programs, Reviews, State government.
Identifiers: ERDA/140000, ERDA/299001, ERDA/140400.

For abstract, see ERA citation 04:038353.

SERI/TR-51-162 PC **A03**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Implementation of State Solar Incentives: State Testing and Certification.
R. Odland. Mar 79, 38p
Contract EG-77-C-01-4042

Descriptors: *Solar energy, *Solar industry, California, Financial incentives, Florida, Government policies, Implementation, Minnesota, Oregon, Solar collectors, Standards, State government, Taxes, Testing.
Identifiers: ERDA/140300, ERDA/299001, ERDA/140400.

For abstract, see ERA citation 04:038362.

SERI/TR-62-148 PC **A04**/MF **A01**
Solar Energy Research Inst., Golden, CO.
Organized Labor and Solar Energy.
Feb 79, 67p
Contract EG-77-C-01-4042

Descriptors: *Solar industry, Commercialization, Construction, Consumption rates, Employment, Installation, Labor, Labor relations, Market, Occupations, Production, Solar Energy Research Institute, Technology utilization, US DOE, Work.
Identifiers: ERDA/140400, ERDA/299001, Labor unions, Marketing.

For abstract, see ERA citation 04:038368.

SOLAR/0009-78/27 PC **A04**/MF **A01**
International Business Machines Corp., Huntsville, AL.
Environmental Data for Selected Solar Energy Sites.
30 Jun 78, 54p
Contract EG-77-C-01-4049

Descriptors: *Ambient temperature, *Humidity, *Insolation, *Wind, Daily variations, Data acquisition, Experimental data, Regional analysis, Tables, USA.
Identifiers: ERDA/140100.

For abstract, see ERA citation 04:044475.

UCRL-15000 PC **A04**/MF **A01**
California Univ., Berkeley. Inst. of Governmental Studies.
Problems of Social Organization in California's Energy Industry: Lessons from the Present and Considerations for a Distributed Future.
T. K. Bradshaw, E. Eagle, and N. Cook. Dec 78, 65p
Contract W-7405-ENG-48

Descriptors: *California, Data compilation, *Electric utilities, Energy policy, Forecasting, *Gas utilities, Horizontal integration, Organizing, Ownership, *Petroleum industry, Petroleum refineries, Research programs, Social impact, Tables, Vertical integration.
Identifiers: ERDA/290000, ERDA/290200, Gas industry, Public utilities.

For abstract, see ERA citation 04:041008.

10B. Power Sources

AD-A070 741/4GA PC **A05**/MF **A01**
Spire Corp Bedford MA
Broadened Capabilities in Electrostatic Bonding for Solar Cell Cover Glasses.
Interim technical rept. Jan-Dec 78,
Peter R. Younger, Geoffrey A. Landis, and Roger G. Tobin. Mar 79, 84p IR-79-10057-01, AFAPL-TR-79-2008
Contract F33615-77-C-3120

Descriptors: Bonding, *Solar cells, Electrostatics, Antireflection coatings, Silicon, Glass, Metals, Temperature, Layers.
Identifiers: Encapsulation.

This report describes the first 12 months of a program aimed at furthering the development of electrostatic bonding techniques, so that integral glass covers can be attached to a variety of solar cell types, including those with multiple-layer antireflection (MLAR) coatings, the vertical junction cell, and texture etched cells. The electrostatic bonding facility is described. Tests of electron darkening of cover glasses are discussed. Detailed results of efforts to apply integral covers to various groups of MLAR coated cells are given. Variations upon the program baseline cell are to be tested to determine their compatibility with the electrostatic bonding process. Variations in contact metallization tested to date are discussed. Other variations include junction depth, dimensions (both lateral and thickness), and inclusion of back surface fields and wraparound contacts.

AD-A070 969/1GA PC **A03**/MF **A01**
Naval Ocean Systems Center San Diego CA
Paralleled Power Supplies, A Comparison of Methods of Paralleling Power Supplies with the Method Used in the AEGIS Low-Voltage Power System.
Final rept.,
C. W. Rosengrant. Oct 78, 32p Rept no. NOSC/TR-329

Descriptors: *Power supplies, *Electric power distribution, *Surface to air missiles, Voltage regulators, Ammeters, Bus conductors, Electrical resistance, Failure(Electronics), Low voltage.
Identifiers: AEGIS missiles.

This report was prepared as part of the reliability studies of the AEGIS low-voltage power supply and compares methods of paralleling power supplies to determine the method most suitable for the AEGIS system. The two fundamental methods of paralleling power supplies are the automatic crossover method and master/slave method. The automatic crossover method as two subdivisions: (1) automatic crossover method (used by AEGIS system); and (2) the spoiler resistor method. The master/slave method has three subdivisions: (1) master pass element drive; (2) master voltage reference; and (3) current sense. The degree of current sharing that may be expected from these methods varies and depends on the method and how it was used. The automatic crossover method is characterized by unequal current sharing and closely regulated power supplies; however, if regulation can be sacrificed, a degree of current sharing may be achieved. The master/slave method theoretically offers equal current sharing but, because of inescapable component differences, only the current sense method offers a reliable method for achieving this. A comparison of the methods of paralleling power supplies show advantages and disadvantages for each; The master/slave method may have a slightly higher individual power supply reliability because of its equal load-sharing characteristics; however, this reliability advantage does not consider the additional control circuitry that would reduce reliability.

AD-A071 157/2GA PC **A03**/MF **A01**
Engelhard Minerals and Chemicals Corp Edison NJ Research and Development Dept
Design and Development of a 30 Watt Solid Polymer Electrolyte Fuel Cell Power Source Fueled with Calcium Hydride.
Final technical rept.,
O. Adlhart. 12 Dec 78, 26p
Contract DAAK70-77-C-0222

Descriptors: *Fuel cells, *Electrolytic cells, *Polymers, *Calcium hydrides, Research management, Power supplies, Hydrogenation, Test and evaluation, Ammonia, Low temperature, Gas generating systems, Experimental design.

In recent years MERDCOM has shown renewed interest in the Solid Polymer Electrolyte Hydrogen-Air Fuel Cell. It focuses on the broad spectrum of applications where power requirements are quite small ranging from fractions of a watt to a few hundred watts. Handling simplicity and versatility are of utmost importance in this power range. The SPE cell is uniquely suited. It is operative at about ambient temperatures, is rugged and has excellent life characteristics. Combined with a solid hydrogen source such as calcium hydride or magnesium high energy densities are attainable. A 24 Volt, 30 Watt device was developed under the contract consisting of a static SPE stack integrated with a hydrogen generator utilizing cartridge contained calcium hydride. Even in short missions of a few hours energy densities are well in excess of those obtained with secondary batteries.

ANL/MHD-78-10 PC **A05**/MF **A01**
Argonne National Lab., IL.
MHD Balance-of-Plant Technology Project. Third Quarterly Report, July--September 1978.
M. Petrick, K. E. Tempelmeyer, and T. R. Johnson. Jan 79, 89p
Contract W-31-109-ENG-38

Descriptors: *Coal-fired mhd generators, *Mhd power plants, *Seed-slag interactions, Air heaters, Analytical solution, Boilers, Chemical composition, Chemical reactions, Corrosion, Cost, Desulfurization, Experimental data, Heat recovery, Heat transfer, Isolated values, Materials, Materials testing, Mathematical models, Nitrogen oxides, Open-cycle mhd generators, Particle size, Potassium hydroxides, Potassium sulfates, Pressure drop, Refractories, Removal, Seed recovery, Slags, Spent seed, Test facilities, Theoretical data, Thermal conductivity, Waste heat.
Identifiers: ERDA/300103, ERDA/360604, ERDA/360603.

For abstract, see ERA citation 04:044950.

ANL/MHD-78-6 PC **A06**/MF **A01**
Argonne National Lab., IL.
Program Plan for Development of Heat and Seed Recovery Components for a Coal-Fired, Open-Cycle MHD Power Plant.
T. R. Johnson. Jun 78, 110p
Contract W-31-109-ENG-38

Descriptors: *Air heaters, *Coal-fired mhd generators, *Mhd power plants, *Seed recovery, Air pollution control, Ashes, Auxiliary systems, Boilers, Bottoming cycles, Coal preparation, Combined-cycle power plants, Electrostatic precipitators, Exhaust gases, Heat recovery, Materials, Mhd generator etf, Nitrogen oxides, Open-cycle mhd generators, Regeneration, Seed-slag interactions, Spent seed, Steam generators, Steam turbines, Sulfur oxides, Superheating.
Identifiers: ERDA/300103, Electric power plants, Coal fired power plants.

For abstract, see ERA citation 04:044949.

ANL/MHD-79-3 PC **A04**/MF **A01**
Argonne National Lab., IL.
Parametric Study of the Performance of a CDIF 1-B Coal-Fired MHD Generator.
R. K. Ahluwalia, H. K. Geyer, and E. D. Doss. Feb 79, 55p
Contract W-31-109-ENG-38

Descriptors: *Mhd generator cdif, Current density, Diffusers, Flow rate, Magnetic fields, Mhd channels, Mhd generator etf, Optimization, Performance, Performance testing, Pressure dependence, Simulation, Subsonic flow, Thermal efficiency.
Identifiers: ERDA/300102, Magnetohydrodynamic generators.

For abstract, see ERA citation 04:044947.

ANL/MHD-79-5 PC **A03**/MF **A01**
Argonne National Lab., IL.
MHD Heat and Seed Recovery Technology Project. Fourth Quarterly Report, October--December 1978.
M. Petrick, K. E. Tempelmeyer, and T. R. Johnson. Feb 79, 48p
Contract W-31-109-ENG-38

Descriptors: *Coal-fired mhd generators, Boilers, Chemical reactions, Corrosion resistance, Desulfurization, Diffusers, Heat recovery, Heat transfer, Materials, Materials testing, Mathematical models, Mhd channels, Nitrogen oxides, Potassium, Potassium sulfates, Potassium sulfides, Regeneration, Research programs, Scaling, Seed recovery, Seed-slag interactions, Slags, Spent seed.

Identifiers: ERDA/300103, Magnetohydrodynamic generators.

For abstract, see ERA citation 04:044951.

CONF-780952-46 PC **A03**/MF **A01**
Argonne National Lab., IL.
Superconducting Dipole Magnet for the UTSI MHD Facility.
S. T. Wang, R. C. Niemann, and L. R. Turner.
1978, 31p
Contract W-31-109-ENG-38
Applied superconductivity conference, Pittsburgh, PA, USA, 25 Sep 1978.

Descriptors: *Mhd generator utsi, *Superconducting magnets, Control systems, Cryostats, Design, Dipoles, Geometry, Magnetic fields, Power supplies, Stability.
Identifiers: ERDA/300503, ERDA/420201.

For abstract, see ERA citation 04:043259.

CONF-790459-2 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Thermodynamic Assessment of OTEC Open-Cycle Power Systems.
F. C. Chen. 1979, 6p
Contract W-7405-ENG-26
Instrument Society of America, Pittsburgh modeling and simulation conference, Pittsburgh, PA, USA, 25 Apr 1979.

Descriptors: *Ocean thermal energy conversion, *Open-cycle systems, Optimization, Performance, Thermodynamics.
Identifiers: ERDA/140800, Solar sea power plants, Electric power plants.

For abstract, see ERA citation 04:042653.

COO-2764-002 PC **A07**/MF **A01**
Mechanical Technology, Inc., Latham, NY.
Demonstration of a Free Piston Stirling Engine Driven Linear Alternator System. Annual Report.
1 Sep 78, 126p
Contract EY-76-C-02-2764

Descriptors: *Alternators, *Radioisotope heat sources, *Stirling engines, Design, Energy conversion, Research programs.
Identifiers: ERDA/070301, ERDA/425003.

For abstract, see ERA citation 04:042484.

COO-4094-53 PC **A02**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Test Plan for the Mead 25-KW Photovoltaic Flexible Test Facility "1979".
R. F. Hopkinson. 15 Mar 79, 21p
Contract EY-76-C-02-4094

Descriptors: *Photovoltaic power supplies, Drying, Fertilizers, Irrigation, Manufacturing, Operation, Planning, Power range 10-100 kw, Test facilities, Testing, Uses.
Identifiers: ERDA/140600, ERDA/140501.

For abstract, see ERA citation 04:044541.

DOE/EIA-0172 PC **A08**/MF **A01**
Energy Information Administration, Washington, DC.
Statistics of Publicly Owned Electric Utilities in the United States 1977. Energy Data Report.
Feb 79, 168p

Descriptors: *Electric utilities, USA, Data compilation, Financial data, Information, Operation, Statistics, Tables.
Identifiers: ERDA/296000.

For abstract, see ERA citation 04:036714.

DOE/EIA-0183/2 PC **A03**/MF **A01**
Energy Information Administration, Washington, DC.
Sensitivity of Electric Utilities Dispatch Model in the Midterm Energy Market Model. Technical Report.
R. T. Eynon. May 79, 35p

Descriptors: *Electric utilities, Capacity, Capital, Coal, Decision making, Demand factors, Economic analysis, Economic impact, Fuels, Mathematical models, Performance, Rate structure, Regulations, USA.
Identifiers: ERDA/296000, ERDA/290200, ERDA/290100.

For abstract, see ERA citation 04:043235.

DOE/ET-0093 PC **A07**/MF **A01**
Department of Energy, Washington, DC. Office of Solar, Geothermal, Electric and Storage Systems.
Wind Energy Systems: Program Summary.
Dec 78, 134p

Descriptors: US DOE, *Wind power plants, *Wind turbines, Research programs.
Identifiers: ERDA/170000, ERDA/299003, *Wind power generation.

For abstract, see ERA citation 04:042812.

DOE/JPL/1012-78/2 PC **A07**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
LSA Low-Cost Solar Array Project. Project Quarterly Report No. 6, July–September 1977.
1977, 135p JPL-PUBL-78-83
Contract EX-76-A-29-1012

Descriptors: *Silicon solar cells, *Solar cell arrays, Casting, Contracts, Cost, Cost benefit analysis, Crystal growth, Cutting, Efficiency, Electrical properties, Encapsulation, Fabrication, Failures, Manufacturing, Optimization, Performance testing, Polymers, Production, Research programs, Temperature dependence.
Identifiers: ERDA/140501, ERDA/360601.

For abstract, see ERA citation 04:044486.

DOE/JPL/954356-7A PC **A04**/MF **A01**
Honeywell Corporate Material Sciences Center, Bloomington, MN.
Silicon on Ceramic Process. Silicon Sheet Growth and Device Development for the Large-Area Silicon Sheet and Cell Development Tasks of the Low-Cost Solar Array Project. Quarterly Report No. 10, September 30–December 31, 1978.
P. W. Chapman, J. D. Zook, J. D. Heaps, C. Pickering, and B. L. Grung. 31 Jan 79, 62p
Contract NAS-7-100-954356

Descriptors: *Silicon, *Silicon solar cells, Ceramics, Dip coating, Dipped coatings, Electric contacts, Electrical properties, Equipment, Fabrication, Isotherm, Performance, Research programs, Sheets, Substrates.
Identifiers: ERDA/140501, ERDA/360601.

For abstract, see ERA citation 04:044487.

DOE/JPL/954363-8 PC **A13**/MF **A01**
Motorola, Inc., Phoenix, AZ. Semiconductor Group.
Phase I of the Automated Array Assembly Task of the Low Cost Silicon Solar Array Project. Final Report.
R. A. Pryor, L. A. Grenon, and M. G. Coleman.
Jan 78, 299p
Contract NAS-7-100-954363

Descriptors: *Silicon solar cells, Antireflection coatings, Carrier lifetime, Chemical vapor deposition, Cleaning, Cost, Coverings, Crystal doping, Crystal growth, Design, Dimensions, Efficiency, Electric conductivity, Electric contacts, Electric currents, Electric potential, Electrical properties, Etching, Fabrication, Fill factors, Industrial plants, Ion implantation, Manufacturing, Optimization, P-n junctions, Plating, Processing, Recombination, Reflectivity, Sintering, Size, Spectral response.
Identifiers: ERDA/140501, ERDA/360601.

For abstract, see ERA citation 04:044488.

DOE/JPL/954372-6 PC **A12**/MF **A01**
Rockwell International, Anaheim, CA. Electronic Devices Div.
Chemical Vapor Deposition Growth. Final Report, December 29, 1975–August 31, 1977.
R. P. Ruth, A. G. Campbell, J. L. Kenty, G. L. Shaw, and J. J. Yang. Oct 78, 257p
Contract NAS-7-100-954372

Descriptors: *Silicon, Silicon solar cells, Boron ions, Chemical reactors, *Chemical vapor deposition, Economics, Evaluation, Fabrication, Impurities, Performance testing, Phosphorus ions, Research programs, Sheets, Substrates, Temperature effects.
Identifiers: ERDA/140501, ERDA/360601.

For abstract, see ERA citation 04:044489.

DOE/JPL/954777-6 PC **A02**/MF **A01**
AeroChem Research Labs., Inc., Princeton, NJ.
Silicon Halide–Alkali Metal Flames as a Source of Solar Grade Silicon. Sixth Quarterly Report.
D. B. Olson, and W. J. Miller. Jan 79, 15p
AeroChem-TN-201
Contract NAS-7-100-954777

Descriptors: *Silicon, Chemical reactors, Flames, Heat losses, Production, Purification, Silicon chlorides, Silicon fluorides, Silicon solar cells, Sodium.
Identifiers: ERDA/140501, ERDA/360601, *Silicon halides, *Alkali metals.

For abstract, see ERA citation 04:044490.

DOE/JPL/954833-1 PC **A08**/MF **A01**
Boeing Engineering and Construction Co., Seattle, WA.
Feasibility Study of Solar Dome Encapsulation of Photovoltaic Arrays. Low-Cost Solar Array Project, Engineering Area. Phase I: Final Report.
D. K. Zimmerman. Dec 78, 175p
Contract NAS-7-100-954833

Descriptors: *Solar cell arrays, Cooling systems, Cost, Coverings, Cylindrical configuration, Design, Encapsulation, Feasibility studies, Life-cycle cost, Maintenance, Manufacturing, Performance, Photovoltaic power plants, Plastics, Solar tracking, Spherical configuration, Stress analysis, Supports.
Identifiers: ERDA/140501, ERDA/140600.

For abstract, see ERA citation 04:044491.

DOE/JPL/954847-3 PC **A03**/MF **A01**
Motorola, Inc., Phoenix, AZ. Semiconductor Group.
Phase 2 of the Automated Array Assembly Task of the Low Cost Silicon Solar Array Project. Technical Quarterly Report No. 3, April–June 1978.
M. G. Coleman, E. M. Pastirik, and R. A. Pryor.
1978, 43p
Contract NAS-7-100-954847

Descriptors: *Silicon solar cells, Arsenic ions, Automation, Boron ions, Electric contacts, Etching, Ion implantation, Manufacturing, Performance, Performance testing, Phosphorus ions, Plating, Production, Silicon.
Identifiers: ERDA/140501.

For abstract, see ERA citation 04:044492.

DOE/JPL/954876-5 PC **A03**/MF **A01**
Battelle Columbus Labs., OH.
Development and Evaluation of Die and Container Materials. Fifth Quarterly Progress Report, October 1–December 31, 1978.
R. R. Wills, and D. E. Niesz. 15 Jan 79, 31p
Contract NAS-7-100-954876

Descriptors: *Crucibles, *Crystal growth, *Dies, *Silicon, Aluminium, Aluminium compounds, Beryllium, Beryllium compounds, Chemical analysis, Compatibility, Impurities, Machining, Mass spectroscopy, Materials, Production, Silicon solar cells.
Identifiers: ERDA/140501, ERDA/360601, Silicon nitrides, Aluminum nitrides, Aluminum oxides, Beryllium oxides, Beryllium nitrides.

For abstract, see ERA citation 04:044493.

DOE/JPL/954877-4 PC **A05**/MF **A01**
Eagle-Picher Industries, Inc., Miami, OK. Miami Research Labs.
Study Program to Develop and Evaluate Die and Container Materials for the Growth of Silicon Ribbons. Quarterly Report No. 4.
P. E. Grayson, and L. A. Addington. Oct 78, 68p
Contract NAS-7-100-954877

Descriptors: *Crucibles, *Dies, Silicon solar cells, Aluminium nitrides, Coatings, Fabrication, Microstructure, *Silicon, Silicon carbides, Silicon nitrides.
Identifiers: ERDA/140501.

For abstract, see ERA citation 04:042571.

DOE/JPL/954888-4 PC **A04**/MF **A01**
Kayex Corp., Rochester, NY.
Continuous Czochralski Growth. Silicon Sheet Growth Development of the Large Area Silicon Sheet Task of the Low Cost Silicon Solar Array Project. First Annual Progress Report, October 1, 1977--September 30, 1978.
R. L. Lane. 1978, 52p
Contract NAS-7-100-954888

Descriptors: Crystal growth, *Silicon, Control systems, Cost, Crucibles, *Czochralski method, Design, Efficiency, Equipment, Furnaces, Impurities, Modifications, Monocrystals, Performance, Silicon solar cells.
Identifiers: ERDA/140501, ERDA/360601.

For abstract, see ERA citation 04:044494.

DOE/JPL/954995-2 PC **A03**/MF **A01**
Dow Corning Corp., Midland, MI.
Develop Silicone Encapsulation Systems for Terrestrial Silicon Solar Arrays. Second Quarterly Progress Report, July 3--September 29, 1978.
10 Oct 78, 39p
Contract NAS-7-100-954995

Descriptors: *Silicon solar cells, *Silicones, *Solar cell arrays, Dusts, Encapsulation, Glass, Performance, Substrates, Weathering.
Identifiers: ERDA/140501.

For abstract, see ERA citation 04:042572.

DOE/JPL/955055-1 PC **A03**/MF **A01**
Spectrolab, Inc., Sylmar, CA.
Silicon Solar Cell Process Development, Fabrication, and Analysis. First Quarterly Report, August 28, 1978--December 31, 1978.
J. A. Minahan. 1978, 29p
Contract NAS-7-100-955055

Descriptors: *Silicon, *Silicon solar cells, Cutting, Efficiency, Fabrication, Planning, Quality control.
Identifiers: ERDA/140501, Czochralski method.

For abstract, see ERA citation 04:040529.

DOE/JPL/955077-3 PC **A03**/MF **A01**
Solarex Corp., Rockville, MD.
Evaluation of the Technical Feasibility and Effective Cost of Various Wafer Thicknesses for the Manufacture of Solar Cells. First Quarterly Progress Report, July 15--September 30, 1978.
1978, 28p
Contract NAS-7-100-955077

Descriptors: *Silicon, Cost, Cutting, Experiment planning, Fabrication, Performance, Silicon solar cells, Wires.
Identifiers: ERDA/140501, ERDA/360601.

For abstract, see ERA citation 04:044496.

DOE/TIC-10083 PC **A02**/MF **A01**
Department of Energy, Washington, DC. Economic Regulatory Administration.
Electric Supply Report for Fourth Quarter of 1977 Issued by Economic Regulatory Administration.
15 May 78, 25p

Descriptors: *Electric utilities, *Power systems, Data compilation, Emergency plan, Load management, Outages, Tables.
Identifiers: ERDA/296000, *Supply(Economics), Electric power.

For abstract, see ERA citation 04:044918.

DOE/TIC-10084 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Economic Regulatory Administration.
Outages, Load Reductions, and Other Emergency Situations Bulk Electric System. First Quarter of 1978, January 1--March 31, 1978.
1978, 47p

Descriptors: *Electric utilities, *Power systems, Data compilation, Emergency plan, Hazards, Load management, Outages, Tables.
Identifiers: ERDA/296000, *Supply(Economics), Electric power.

For abstract, see ERA citation 04:044919.

DOE/TIC-10085 PC **A02**/MF **A01**
Department of Energy, Washington, DC. Economic Regulatory Administration.
Outages, Load Reductions, and Other Emergency Situations Bulk Electric System. Second Quarter of 1978, April 1--June 30, 1978.
1978, 21p

Descriptors: *Electric utilities, *Power systems, Emergency plan, Load management, Ou'ages, Tables.
Identifiers: ERDA/296000, *Supply(Economics), Electric power.

For abstract, see ERA citation 04:044920.

DOE/TIC-10086 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Economic Regulatory Administration.
Bulk Electric Energy Supply System Outages and Load Reductions. Fourth Quarter of 1978, October 1--December 31, 1978.
1978, 31p

Descriptors: *Electric utilities, *Power systems, Emergency plan, Equipment, Load management, Outages, Tables.
Identifiers: ERDA/296000, *Supply(Economics), Electric power.

For abstract, see ERA citation 04:044921.

DOE/TIC-10087 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Economic Regulatory Administration.
Bulk Electric Energy Supply System Outages and Load Reductions. Third Quarter of 1978, July 1--September 30, 1978.
1978, 40p

Descriptors: *Electric utilities, *Power systems, Data compilation, Emergency plan, Load management, Outages, Tables.
Identifiers: ERDA/296000, *Supply(Economics), Electric power.

For abstract, see ERA citation 04:044922.

DOE-tr-1 PC **A21**/MF **A01**
Akademiya Nauk SSSR, Leningrad. Fiziko-Tekhnicheskii Inst.
Thermionic Converters and Low-Temperature Plasma.
F. G. Baksht, G. A. Dyuzhev, A. M. Martsinovskiy, B. Ya. Moyzhes, and G. Ye. Pikus. 1978, 490p
C Termoemissionnye preobrazovateli i nizkotemperaturnaia plazma; Izdatel'stvo Nauka, Moscow, 1973.

Descriptors: Cold plasma, *Thermionic converters, Adsorption, Collisions, Electric arcs, Electrodes, Equations, Ionization, Materials, Operation, Plasma diagnostics, Plasma sheath, Recombination, Thermionic collectors, Thermionic diodes, Thermionic emission, Thermionic emitters, Thermionic reactors, Work functions.
Identifiers: ERDA/300400, ERDA/640420, Translations, USSR, Plasma diodes.

For abstract, see ERA citation 04:044957.

FE-1726-17A PC **A08**/MF **A01**
Curtiss-Wright Corp., Wood-Ridge, NJ. Power Systems Div.
Engineer, Design, Construct, Test and Evaluate a Pressurized Fluidized Bed Pilot Plant Using High Sulfur Coal for Production of Electric Power. Phase I. Preliminary Engineering. Annual Report, March 1, 1976--February 28, 1977.
15 Mar 77, 151p CW-WR-76-015.20A
Contract EX-76-C-01-1726

Descriptors: Fluidized-bed combustors, *Fossil-fuel power plants, Coal, Combined-cycle power plants, Design, Dolomite, Engineering, Fluidized-bed combustion, Gas turbines, Heat exchangers, Hot gas cleanup, Materials, Medium pressure, Pilot plants, Site selection, Steam turbines, Thermodynamic cycles, Waste heat utilization.
Identifiers: ERDA/200100, ERDA/014000, ERDA/421000, Electric power plants, High sulfur coal.

For abstract, see ERA citation 04:042829.

FE-1760-32 PC **A05**/MF **A01**
Tennessee Univ. Space Inst., Tullahoma.
Development Program for MHD Direct Coal-Fired Power Generation Test Facility. Quarterly Technical Progress Report, January--March 1978.
J. B. Dicks, Jr., H. P. Markant, and L. W. Crawford. 15 Apr 78, 84p
Contract EX-76-C-01-1760

Descriptors: *Mhd generator utsi, Boilers, Buildings, Coal, Combustion products, Combustors, Construction, Design, Electrodes, Gas analysis, Inverters, Materials testing, Measuring instruments, Oxygen enrichment, Performance testing, Plasma seeding, Research programs, Superconducting magnets, Test facilities.
Identifiers: ERDA/300101, Electric power plants, Coal fired power plants.

For abstract, see ERA citation 04:044936.

FE-2357-13 PC **A05**/MF **A01**
General Electric Co., Schenectady, NY. Energy Systems Programs Dept.
CFCC Development Program. Quarterly Report, January--March 1977.
Apr 77, 84p
Contract EX-76-C-01-2357

Descriptors: *Combined-cycle power plants, Cladding, Comparative evaluations, Design, Gas turbines, Hot gas cleanup, Materials, Steam turbines, Systems analysis, Thermal efficiency, Thermodynamic cycles, Turbine blades.
Identifiers: ERDA/200102, Electric power plants, Coal fired power plants.

For abstract, see ERA citation 04:044709.

FE-2613-6(V.1) PC **A04**/MF **A01**
General Electric Co., Philadelphia, PA. Space Div.
MHD-ETF Program Final Report. Volume 1. Executive Summary.
Mar 78, 58p
Contract EF-77-C-01-2613

Descriptors: *Mhd generator etf, Air heaters, Boilers, Coal-fired mhd generators, Combined-cycle power plants, Combustors, Cost, Cyclone separators, Demonstration plants, Design, Diagrams, Diffusers, Efficiency, Fluidized bed, Heat recovery, Inverters, Maintenance, Operation, Power range 100-1000 mw, Regenerators, Seed recovery, Steam turbines, Superconducting magnets, Thermal efficiency.
Identifiers: ERDA/300101, Electric power plants, Test facilities, Magnetohydrodynamic generators.

For abstract, see ERA citation 04:044939.

FE-2613-6(V.2a) PC **A11**/MF **A01**
General Electric Co., Philadelphia, PA. Space Div.
MHD-ETF Program Final Report. Volume IIA. Parts 1 and 2. Reference Design Description, January 4, 1977--March 4, 1978.
Mar 78, 239p
Contract EF-77-C-01-2613

Descriptors: *Mhd generator etf, Boilers, Buildings, Coal-fired mhd generators, Combined-cycle power plants, Design, Mhd power plants, Nitrogen oxides, Operation, Performance, Power systems, Power transmission, Slags, Steam turbines.
Identifiers: ERDA/300101, Electric power plants, Coal fired power plants, Test facilities, Magnetohydrodynamic generators.

For abstract, see ERA citation 04:044940.

FE-2613-6(V.3) PC **A05**/MF **A01**
General Electric Co., Philadelphia, PA. Space Div.
MHD-ETF Program Final Report, January 4, 1977--March 4, 1978. Volume 3. Program Implementation.
Mar 78, 85p
Contract EF-77-C-01-2613

Descriptors: *Mhd generator etf, Construction, Cost, Maintenance, Operation, Tables.
Identifiers: ERDA/300101, Test facilities, Magnetohydrodynamic generators, Cost estimates.

For abstract, see ERA citation 04:044941.

FE-2614-2(Pt.1) PC **A24**/MF **A01**
Avco Everett Research Lab., Inc., Everett, MA.

Engineering Test Facility Conceptual Design. Final Report, Part 1.
Jun 78, 562p
Contract EF-77-C-01-2614

Descriptors: *Mhd generator etf, Air heaters, Coal-fired mhd generators, Combined-cycle power plants, Combustors, Control systems, Cost, Design, Diagrams, Diffusers, Measuring instruments, Mhd channels, Mhd power plants, Nozzles, Pilot plants, Specifications, Superconducting magnets.
Identifiers: ERDA/300101, Test facilities, Electric power plants, Coal fired power plants.

For abstract, see ERA citation 04:044942.

FE-2614-2(Pt.2) PC **A21**/MF **A01**
Avco-Everett Research Lab., Inc., Everett, MA.
Engineering Test Facility Conceptual Design. Final Report.
Jun 78, 487p
Contract EF-77-C-01-2614

Descriptors: *Mhd generator etf, Buildings, Coal preparation, Coal-fired mhd generators, Combined-cycle power plants, Control systems, Design, Diagrams, Equipment, Exhaust gases, Inverters, Maintenance, Measuring instruments, Mhd power plants, Power systems, Seed recovery, Site selection, Specifications, Steam generators.
Identifiers: ERDA/300101, Test facilities, Electric power plants, Coal fired power plants.

For abstract, see ERA citation 04:044943.

HCP/T2898-01/3 PC **A03**/MF **A01**
Ocean Data Systems, Inc., Monterey, CA.
OTEC Thermal Resource Report for Pacific Plant Ship, 5 to 10 exp 0 N 90 to 95 exp 0 W.
W. A. Wolff. May 79, 44p
Contract ET-78-C-01-2898

Descriptors: *Ocean thermal energy conversion, Pacific Ocean, Depth, Layers, Mixing, Monthly variations, Ships, Site selection, Temperature gradients, Water currents, Weather.
Identifiers: ERDA/140800, Solar sea power plants, Electric power plants.

For abstract, see ERA citation 04:044562.

LA-UR-79-1436 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
High-Density Z-Pinch Pulse-Power Supply System.
W. C. Nunnally, L. A. Jones, and S. Singer. 1979, 7p CONF-790622-2
Contract W-7405-ENG-36
Pulsed power conference, Lubbock, TX, USA, 12 Jun 1979.

Descriptors: *Linear z pinch devices, *Power supplies, Design, Neodymium lasers, Operation, Switches.
Identifiers: ERDA/700203.

For abstract, see ERA citation 04:044131.

LA-UR-79-18 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Economies of Scale, Reliability and Generation Capacity: The Economics of Small Versus Large Electricity Generating Units.
V. W. Loose. 1979, 14p CONF-790107-3
Contract W-7405-ENG-36
National conference and exhibition on technology for energy conservation, Tucson, AZ, USA, 22 Jan 1979.

Descriptors: *Power generation, *Power plants, Capital, Economic analysis, Economics, Electric power, Graphs, Reliability, Size, Tables, Theoretical data.
Identifiers: ERDA/200106, ERDA/296001, Electric power plants.

For abstract, see ERA citation 04:022648.

LA-UR-79-950 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Selected Results from the Technology Assessment of Solar Energy Program.
M. C. Krupka, and J. H. Altseimer. 1979, 8p CONF-790611-3
Contract W-7405-ENG-36
AIAA terrestrial energy systems conference, Orlando, FL, USA, 4 Jun 1979.

Descriptors: *Photovoltaic power supplies, *Solar energy, Design, Environmental impacts, Residential buildings, Solar cell arrays, Technology assessment.
Identifiers: ERDA/140501, ERDA/140400.

For abstract, see ERA citation 04:042575.

LA-7821-MS PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Conceptual Designs for Two Reject Heat Systems for a Brayton Closed-Cycle Converter.
G. A. Bennett. May 79, 34p
Contract W-7405-ENG-36

Descriptors: *Closed-cycle cooling systems, *Space power reactors, Brayton cycle, Design, Heat exchangers, Heat pipes, Reactor cooling systems.
Identifiers: ERDA/210600.

For abstract, see ERA citation 04:044787.

PATENT-4 156 309 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
Method of Construction of a Multi-Cell Solar Array.
Patent,
D. E. Routh, B. R. Hollis, and W. R. Feltner. Filed 23 Dec 77, patented 29 May 79, 4p N79-26475/0, PAT-APPL-863 773
Supersedes PAT-APPL-863 773-77, N78-17468 (16 - 08 p 1036).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: Energy conversion efficiency, Photovoltaic cells, *Solar arrays, Solar energy, Etching, High voltages, MIS(Semiconductors), *Patents, Semiconductor junctions.
Identifiers: PAT-CL-29-572, Sapphire, Silicon solar cells.

The method of constructing a high voltage, low power, multicell solar array is described. A solar cell base region is formed in a substrate such as but not limited to silicon or sapphire. A protective coating is applied on the base and a patterned etching of the coating and base forms discrete base regions. A semiconductive junction and upper active region are formed in each base region, and defined by photolithography. Thus, discrete cells which are interconnected by metallic electrodes are formed.

PB-298 750/1GA PC **A05**/MF **A01**
Illinois Bureau of the Budget, Springfield. Office of Planning.
A Handbook of Sources of Electric Utility Data (with Specific Reference to Illinois),
Ajay K. Sanghi, Russell E. Baldwin, and Charles Sim. Mar 79, 83p ILLDOE-79/10
Sponsored in part by Illinois Inst. of Natural Resources, Springfield.

Descriptors: *Electric utilities, Handbooks, Data, Sources, Capacity, Electric power generation, Sales, Electric power demand, Fuel consumption, Air pollution control, Water pollution control.

The handbook is a compendium of electric utilities data sources. It is divided into four major sections: the first defines the operational and environmental variables upon which most policy related research depends; the second provides a list of the most important sources of information defined by the variables set forth in the first section. The third section provides a detailed outline of the reports electric utilities must file with the Department of Energy/Energy Information Administration (DOE/EIA). These reports are the best fundamental sources of firsthand information available. The reports are also listed in section two, set forth by the variables in section one, rather than in outline form. The fourth section cross-references the first and second sections by categorizing data sources by time period covered and size of reporting unit.

PB-298 753/5GA Not available NTIS
National Bureau of Standards, Washington, DC.
Solar Cell Measurement Technique Development and Other Services.
Final rept.,
D. E. Sawyer, H. K. Kessler, and H. A. Schafft. Jan 79, 10p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Proceedings Photovoltaic Advanced Materials Review Meeting, Held at Vail, CO. on Oct 24-26, 1978, p41-50.

Descriptors: *Solar cells, Performance evaluation, Measurement, Reliability, Optical measurement.
Identifiers: Silicon solar cells, Gallium arsenide solar cells, Cadmium sulfide solar cells, Solar concentrators, Flat plate collectors, Laser applications, MIS(Semiconductors).

This is a summary of work performed in the period September 15, 1977 - September 30, 1978. The objectives of the program are to assist the DOE thin-film photovoltaic effort by developing solar cell device and material measurement techniques using the NBS-developed laser flying-spot scanner, and by assisting DOE in organizing and hosting appropriate workshops and symposia and providing general consultation and liaison services. A new technique is set forth which employs forward-biasing solar cells during scanning to spatially map cell operating and locate certain cell defects such as cracks, and poor emitter ohmic contacts. This technique has been applied with success to a variety of solar cell types including flat-plate Si, GaAs concentrator, GaAs MIS, CdS/Cu2S, and polycrystalline Si. Equipment has been constructed and ancillary techniques have been developed for effective cell scanning and quantification of scanning results. Cells with diameters up to 10 cm may now be scanned without any change in scanner adjustment. A novel, low-noise high-intensity light source for biasing cells optically has been completed. Other project activities, which include planning, organizing, and conducting workshops are outlined in the text.

PB-298 754/3GA Not available NTIS
National Bureau of Standards, Washington, DC.
Performance Criteria for Photovoltaic Power Conditioning, Control, and Storage.
Final rept.
Harry A. Schafft. 1978, 13p
Contract DOE-EG-77-C-01-4042
Pub. in Proceedings DOE Photovoltaics Technology Development and Applications Program Review Conf., Held at Arlington, VA. on Nov 7-9, 1978, p2-39, 2-51, 1978.

Descriptors: *Photovoltaic cells, Performance, Control, Solar cells, Storage.
Identifiers: Power conditioning, Electric energy storage.

As part of an effort managed by the Solar Energy Research Institute for the development of preliminary performance criteria and test standards for photovoltaic systems, two subcommittees - one on Power Conditioning, Control, and Cabling, and one on Storage - met on June 22-23, 1978 in Vail, CO. to make initial identifications of performance criteria. This paper reports on the highlights of and directions taken by these two subcommittees.

PB-298 760-T/GA PC **A15**/MF **A01**
Department of the Interior, Washington, DC.
Vibration of Hydro Units in Hydroelectric Power Plants,
L. A. Vladislavlev. c1979, 339p TT-74-52045
Trans. of mono. Vibratsiya Gidroagregatov Gidroelektricheskikh Stantsii, Moscoe, 1972. Sponsored in part by National Science Foundation, Washington, DC. Special Foreign Currency Science Information Program.

Descriptors: *Hydroelectric power generation, *Vibration, Hydraulic turbines, Turbogenerators, Perturbation, Tests, Vibration damping, Translations, Rotor blades(Turbomachinery), Turbine wheels.
Identifiers: *Foreign technology, Hydroelectric power plants.

This book generalizes the findings of vibration research. It offers methods to determine the causes of excessive vibrations and ways to prevent them. It includes a description of the equipment used in vibration research, methods of investigation and measurement techniques, and an analysis of the

data obtained during balancing and centering of rotors of hydraulic units. The author describes some suggested vibration norms. This book is meant for specialists working in the field of power plant operation, manufacture of hydraulic turbines, and the design of power equipment for hydroelectric power plants.

PB-298 774/1GA PC **A12**/MF **A01**
Dar es Salaam Univ. (Tanzania). Electric Power Lab.
Rural Electrification and Windpower in Tanzania.
Research rept.,
Roland Reichel. Mar 78, 253p EP-7
Master's thesis. Sponsored in part by Agency for International Development, Washington, DC.

Descriptors: *Electric power generation, *Electric power distribution, *Wind power generation, *Tanzania, Rural areas, Electric power damand, Developing countries, Windmills, Design criteria, Theses.
Identifiers: Wind turbines, Wind power plants, Developing country application, Windpowered generators.

Present rural electrification in Tanzania means supplying electricity to townships and to only a few of the existing 8000 registered villages, which are not yet electrified in any considerable numbers due to technical and economical problems. The initial deman is normally low and the distances are too great to justify the expenses of transmission lines. Thus individual power stations seem to be the only alternative. Demand figures for typical villages are evaluated, and compared to data from Europe. Out of the alternative sources of energy only one, the WIND ENERGY, is described in some detail. Some windpower theory and brief explanations of windpower terms are given. The status of current windpower-research is described including a list of past and present prototypes. Based on commercially manufactured WIND ENERGY SYSTEMS and careful cost estimations and calculations, two wind energy supply schemes are proposed: one is for a tele-communication link and the other for a complete village power station of 45 kW rated out-put. The power station based on wind-energy was found to deliver the electricity at prices cheaper than the diesel-based scheme and, under certain conditions, working profitable if current electricity selling prices in Tanzania are considered. Operating and design criteria are discussed.

PNL-2739(Pt.1) PC **A04**/MF **A01**
Tracor Marine, Port Everglades, FL. Ocean Technology Div.
Ocean Thermal Energy Conversion (OTEC) Biofouling and Corrosion Experiment (1977), St. Croix, U.S. Virgin Islands. Project Summary, Final Report. Part I of a Three-Part Report.
Feb 78, 51p
Contracts W-31-109-ENG-38, EY-76-C-06-1830

Descriptors: *Ocean thermal power plants, Bathymetry, Biological fouling, Caribbean sea, Corrosion, Data acquisition, Heat exchangers, Heat transfer, Ocean thermal energy conversion, Offshore sites, Performance testing, Test facilities, Tubes, West indies.
Identifiers: ERDA/140800, Solar sea power plants, Electric power plants.

For abstract, see ERA citation 04:044565.

PNL-2739(Pt.2) PC **A05**/MF **A01**
Rosenstiel School of Marine and Atmospheric Science, Miami, FL.
Ocean Thermal Energy Conversion (OTEC) Biofouling and Corrosion Experiment (1977), St. Croix, U.S. Virgin Islands. Corrosion Studies, Final Report. Part II of a Three-Part Report.
R. S. C. Munier, and H. L. Craig. Feb 78, 85p
Contracts W-31-109-ENG-38, EY-76-C-06-1830

Descriptors: *Heat exchangers, *Ocean thermal power plants, Aluminium, Aluminium alloys, Caribbean sea, Cleaning, Corrosion, Corrosion resistance, Corrosive effects, Offshore sites, Seawater, Temperature gradients, Test facilities, West indies.
Identifiers: ERDA/140800, Solar sea power plants, Electric power plants.

For abstract, see ERA citation 04:044566.

RI/RD-78-212 PC **A03**/MF **A01**
Rockwell International, Canoga Park, CA. Rocketdyne Div.
Advanced Coal-Fueled Combustor/Heat Exchanger Technology Study. Final Report, March 1977–June 1978.
1978, 42p
Contract EF-77-C-01-2612

Descriptors: *Combined-cycle power plants, *Combustors, *Heat exchangers, Carbon dioxide, Closed-cycle systems, Comparative evaluations, Cost, Design, Gas turbines, Helium, Materials, Power generation, Steam turbines, Thermodynamic cycles, Working fluids.
Identifiers: ERDA/200104, Electric power plants.

For abstract, see ERA citation 04:044716.

SAND-78-7038(V.1) PC **A03**/MF **A01**
BDM Corp., Albuquerque, NM.
Photovoltaic Transient Analysis Program User's Guide. Volume I. Executive Summary.
T. J. Lambarski, A. F. Malmberg, K. E. Melick, R. M. Turfler, and M. G. Semmens. Oct 78, 29p
Contract EY-76-C-04-0789

Descriptors: *Computer codes, *Power conditioning circuits, *Solar cell arrays, Design, Electric batteries, Electronic circuits, Heat transfer, Inverters, Mathematical models, Monte carlo method, Network analysis, Optimization, P codes, Systems analysis, Transients, Voltage regulators.
Identifiers: ERDA/140501, PV-TAP computer program, Computer aided analysis.

For abstract, see ERA citation 04:044508.

SAND-78-7038(V.2) PC **A12**/MF **A01**
BDM Corp., Albuquerque, NM.
Photovoltaic Transient Analysis Program User's Guide. Volume II. Guide to Photovoltaic Elements.
T. J. Lambarski, A. F. Malmberg, K. E. Melick, R. M. Turfler, and M. G. Semmens. Oct 78, 262p
Contract EY-76-C-04-0789

Descriptors: *Computer codes, *Power conditioning circuits, *Solar cell arrays, Algorithms, Electric batteries, Electronic circuits, Heat transfer, Insolation, Inverters, Mathematical models, Network analysis, Optimization, P codes, Programming, Systems analysis, Transients, Voltage regulators.
Identifiers: ERDA/140501, PV-TAP computer program, Computer aided analysis.

For abstract, see ERA citation 04:044509.

SAND-78-7038(V.3) PC **A13**/MF **A01**
BDM Corp., Albuquerque, NM.
Photovoltaic Transient Analysis Program User's Guide. Volume III. PV-TAP/NET-2 User's Manual.
T. J. Lambarski, A. F. Malmberg, K. E. Melick, R. M. Turfler, and M. G. Semmens. Oct 78, 297p
Contract EY-76-C-04-0789

Descriptors: *Computer codes, *Solar cell arrays, Algorithms, Electronic circuits, Equivalent circuits, Mathematical models, Monte carlo method, N codes, Network analysis, Optimization, P codes, Power conditioning circuits, Systems analysis, Transients.
Identifiers: ERDA/140501, PV-TAP computer program.

For abstract, see ERA citation 04:044510.

SAND-79-7017 PC **A06**/MF **A01**
Power Technologies, Inc., Schenectady, NY.
Induction and Synchronous Machines for Vertical Axis Wind Turbines. Final Report.
E. N. Hinrichsen. Jun 79, 123p
Contract EY-76-C-04-0789

Descriptors: *Darrieus rotors, *Electric generators, Comparative evaluations, Performance, Power transmission.
Identifiers: ERDA/170603.

For abstract, see ERA citation 04:044707.

SAND-79-8183 PC **A07**/MF **A01**
Foster Wheeler Energy Corp., Livingston, NJ.
Interim Structural Design Standard for Solar Energy Applications. Final Report, Phases 1 and 2.
I. Berman, A. C. Gangadharan, G. D. Gupta, and T. V. Narayanan. Jan 79, 148p
Contract AC04-76DP00789

Descriptors: *Boilers, *Central receivers, *Pressure vessels, *Tower focus power plants, Creep, Design, Fatigue, Pipes, Ruptures, Standards, Testing.
Identifiers: ERDA/140702, Electric power plants.

For abstract, see ERA citation 04:044553.

10C. Energy Storage

AD-A070 881/8GA PC **A04**/MF **A01**
Energy Research Corp Danbury CT
Improvement of Phosphoric Acid Fuel Cell Stacks.
Interim technical rept. Aug 77-Nov 78,
S. G. Abens, F. J. Ascenzo, B. S. Baker, G. Garretson, and M. Lambrech. May 79, 71p
Contract DAAK70-77-C-0174

Descriptors: *Fuel cells, *Phosphoric acids, Bipolar systems, Hydrogen, Carbinols, Electrodes, Fiber reinforced composites, Matrix materials, Phenolic plastics, Silicon carbides.

Phosphoric acid fuel cell components and stack assembly methods were evaluated. Electrodes with Pt loading between 0.3 and 0.9 g/sq. ft. were employed. Matrix materials were phenolic (Kynol) fibers and SiC. Graphite bipolar plates with 33% phenolic resin binder were used. Stacks were tested on hydrogen and simulated reformed methanol for up to 6,800 hours. An 80-cell (2.1 kW) stack was built and delivered to MERADCOM. (Author)

ANL-K-78-3983-1 PC **A09**/MF **A01**
Sigma Research, Inc., Richland, WA.
Road Vehicle Thermal Energy Storage Concept and Evaluation: Phase I. Final Report, January--October 1978.
E. D. Waters. Dec 78, 179p
Contract W-31-109-ENG-38

Descriptors: *Thermal energy storage equipment, *Vehicles, Design, Environmental effects, Eutectics, Evaluation, Experimental data, Graphs, Latent heat storage, Magnesium fluorides, Materials, Mathematical models, Stirling engines, Tables.
Identifiers: ERDA/330201, ERDA/250600.

For abstract, see ERA citation 04:045060.

ANL-79-1 PC **A03**/MF **A01**
Argonne National Lab., IL.
Engineering Development of Lithium/Metal Sulfide Battery Technology for Vehicle Propulsion. Summary Report, October 1977--September 1978.
D. L. Barney, A. A. Chilenskas, W. H. DeLuca, E. R. Hayes, and F. Hornstra. Mar 79, 35p
Contract W-31-109-ENG-38

Descriptors: *Electric-powered vehicles, *Lead-acid batteries, *Lithium-sulfur batteries, Battery chargers, Containers, Cost, Experimental data, Isolated values, Mechanical tests, Off-peak energy storage, Performance testing, Research programs, Sulfides.
Identifiers: ERDA/250901.

For abstract, see ERA citation 04:044871.

CAES-11 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
Cost Analysis of Packed Beds for Thermal-Energy Storage.
N. I. Hamilton. 30 Dec 78, 36p
Contract EX-76-A-01-2295

Descriptors: *Packed bed, *Thermal energy storage equipment, Cavities, Compressed air energy storage, Cost, Investment, Rocks, Sensible heat storage.
Identifiers: ERDA/250600, ERDA/250200, ERDA/290700, Cost analysis.

For abstract, see ERA citation 04:044867.

COO-4546-3 PC **A03**/MF **A01**
Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
Trans-Seasonal Storage of Solar Energy. Final Report of Innovative Research Program Subtask, December 1977–September 1978.
W. D. Kemper, and W. R. Walker. Oct 78, 27p
Contract EG-77-S-02-4546

Descriptors: Soils, *Thermal energy storage equipment, Economics, Graphs, Mathematical models, Numerical data, Sensible heat storage, Simulation, Thermal conductivity, Thermal efficiency.
Identifiers: ERDA/142000, Underground storage, Reservoirs, Solar energy, Heat storge.

For abstract, see ERA citation 04:044654.

EPRI-EM-1037(V.1) PC **A12**/MF **A01**
General Electric Co., Schenectady, NY.
Conceptual Design of Thermal Energy Storage Systems for Near-Term Electric Utility Applications. Volume 1: Screening of Concepts.
W. Hausz, B. J. Berkowitz, and R. C. Hare. Apr 79, 269p
Contract EC-77-A-31-1034

Descriptors: *Electric utilities, *Thermal energy storage equipment, Cost benefit analysis, Design, Economics, Evaluation, Latent heat storage, Molten salts, Off-peak energy storage, Oils, Performance, Rock caverns, Sensible heat storage, Underground storage, Water.
Identifiers: ERDA/250600, ERDA/200107, Heat storage, Electric power plants.

For abstract, see ERA citation 04:041002.

EPRI-EM-1037(V.2) PC **A08**/MF **A01**
General Electric Co., Schenectady, NY.
Conceptual Design of Thermal Energy Storage Systems for Near-Term Electric Utility Applications. Volume 2. Appendixes: Screening of Concepts.
W. Hausz, B. J. Berkowitz, and R. C. Hare. Apr 79, 151p
Contract EC-77-A-31-1034

Descriptors: *Electric utilities, *Thermal energy storage equipment, Bibliographies, Design, Latent heat storage, Molten salts, Oils, Phase change materials, Sensible heat storage.
Identifiers: ERDA/250600, ERDA/200107, Heat storage Electric power plants.

For abstract, see ERA citation 04:041003.

EPRI-EM-1051(Pt.4)(App.) PC **A14**/MF **A01**
Energy Development Associates, Madison Heights, MI.
Development of the Zinc--Chlorine Battery for Utility Applications. Interim Report, January 1, 1977–March 31, 1978.
J. Birk. Apr 79, 310p

Descriptors: *Off-peak energy storage, Electric utilities, Electrodes, Electrolytes, Graphs, Materials, Performance testing, Research programs, Theoretical data, *Zinc-chlorine batteries.
Identifiers: ERDA/250901, ERDA/250904.

For abstract, see ERA citation 04:043169.

N79-28669/6GA PC **A23**/MF **A01**
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
The 11th Annual Battery Workshop.
1978, 545p NASA-CP-2088
Conf-Workshop Held at Goddard Space Flight Center, Greenbelt, MD., 15-17 Nov. 1978.

Descriptors: *Conferences, *Electrochemistry, *Spacecraft power supplies, *Storage batteries, Electric discharges, Electrical resistivity, Lithium sulfur batteries, Nickel cadmium batteries, Safety factors, Silver hydrogen batteries.

For abstract, see STAR 1719

PATENT-4 159 366 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Electrochemical Cell for Rebalancing Redox Flow System.
Patent,
L. H. Thaller. Filed 9 Jun 78, patented 26 Jun 79, 5p N79-26474/3, PAT-APPL-914 260
Supersedes PAT-APPL-914 260-78, N78-25554 (16 - 16 P2137).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: *Electric energy storage, *Electrochemical cells, *Oxidation-reduction reactions, Anodes, Cathodes, Chromium, Hydrogen, Ions, *Patents.
Identifiers: PAT-CL-429-15, *Electric batteries.

An electrically rechargeable REDOX cell or battery system including one of more rebalancing cells is described. Each rebalancing cell is divided into two chambers by an ion permeable membrane. The first chamber is fed with gaseous hydrogen and a cathode fluid which is circulated through the cathode chamber of the REDOX cell is also passed through the second chamber of the rebalancing cell. Electrochemical reactions take place on the surface of insert electrodes in the first and second chambers to rebalance the electrochemical capacity of the anode and cathode fluids of the REDOX system.

SAND-79-0814 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Development of a Lithium Alloy/Iron Disulfide, 60-Minute Primary Thermal Battery.
R. K. Quinn, A. R. Baldwin, J. R. Armijo, P. G. Neiswander, and D. E. Zurawski. Apr 79, 41p
Contract EY-76-C-04-0789

Descriptors: *Thermal batteries, Ambient temperature, Electrochemistry, Feasibility studies, Lithium alloys, Lithium chlorides, Performance testing, Potassium chlorides, Pyrite, Silicon alloys.
Identifiers: ERDA/250901.

For abstract, see ERA citation 04:044872.

TID-28781 PC **A09**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA. Research and Development Center.
Energy Storage for Photovoltaic Conversion. Volume II. Utility Systems. Final Report.
W. Feduska, H. S. Kirschbaum, C. R. Chowaniec, N. J. Maskalick, and J. L. Maitlen. 30 Sep 77, 192p
Contract EY-76-C-04-2744

Descriptors: *Lead-acid batteries, *Photovoltaic power plants, *Photovoltaic power supplies, *Residential buildings, *Zinc-chlorine batteries, Auxiliary systems, Cost, Design, Electric batteries, Electric utilities, Energy storage systems, Equipment interfaces, Evaluation, Life-cycle cost, Maintenance, Power conditioning circuits, Reliability, Safety, Service life, Size, Systems analysis.
Identifiers: ERDA/140600, ERDA/250901, ERDA/250902, ERDA/140501, Electric power plants.

For abstract, see ERA citation 04:032929.

11. MATERIALS

11A. Adhesives and Seals

AD-A071 037/6GA PC **A02**/MF **A01**
Army Inst of Dental Research Washington DC
Effect of Tin-Plating Upon Adhesive Bonding of Polycarboxylate Cements.
Rept. for Feb-Sep 78,
L. Lorton, B. K. Moore, J. W. Morse, and R. W. Phillips. 22 May 79, 6p

Descriptors: *Cements, *Adhesive bonding, *Gold, *Plating, Tin, Surfaces, Surface properties, Bonding, Cleaning.
Identifiers: Polycarboxylates.

It has been suggested that tin-plated gold surfaces would more easily be adhered to by polycarboxylate cement. Controlled tin plating studies were carried out to test this hypothesis. It was found that scrupulous cleaning of the gold surface produced adhesive bonding that equalled bond strength to tin plated surface. Cement failures were cohesive rather than adhesive suggesting that bond strengths approach cohesive strength of cement. (Author)

PATENT-4 100 019 Not available NTIS
Department of Energy, Washington, DC.
Nozzle Seal.
Patent,
R. D. Groff, and R. J. Vatovec. Filed 27 Jun 75, patented 11 Jul 78, 6p PAT-APPL-591 255
Supersedes PAT-APPL-591 255-75.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Pressure vessels, Pwr type reactors, *Seals, Design, Nozzles.
Identifiers: ERDA/210200, *Patents.

For abstract, see ERA citation 04:042900.

11B. Ceramics, Refractories, and Glasses

AD-A070 803/2GA PC **A02**/MF **A01**
Illinois Univ at Urbana-Champaign Dept of Ceramic Engineering
Densification of PZT Ceramics with V2O5 Additive.
Technical rept.,
D. E. Wittmer, and R. C. Buchanan. Jan 79, 24p
Rept no. TR-1
Contract N00014-78-C-0279

Descriptors: *Ceramic materials, *Density, Vanadium compounds, Oxides, Additives, Powders, Processing, Dielectric properties, Microstructure.
Identifiers: Lead zirconates, Lead titanates, Vanadium oxides.

Additions of V2O5 from 0.1 to 8.0 w/o to a coprecipitated Pb(Zr.53 Ti.47) O3 ceramic promoted rapid densification below 1025 C, eliminating the need for PbO atmosphere control. Dielectric properties were found to be dependent on the amount of V2O5 added and on the microstructure developed, but were comparable to reported values for this PZT composition for additions of V2O5 < or = 1.5 W/O. The indicated densification mechanism is one of activated sintering catalyzed by generation of oxygen defects on decomposition of the V2O5.

AD-A070 909/7GA PC **A06**/MF **A01**
General Electric Co Philadelphia PA Re-Entry and Environmental Systems Div
Advanced Optical Ceramics.
Quarterly research and development status rept. no. 3, 1 Dec 78-28 Feb 79 on Phase 1,
Solomon Musikant, R. A. Tanzilli, J. J. Gebhardt, H. W. Rauch, Sr., and A. Gatti. 15 Mar 79, 114p
Contract N00014-78-C-0466, DARPA Order-3387

Descriptors: Infrared domes, Infrared windows, Guided missile windows, Antenna windows, Electrooptics, *Ceramic materials, Aluminum oxides, Zirconium oxides, Chromium compounds, Oxides, Optical properties, Refractive index, Thermal expansion.
Identifiers: Sialon, *Optical materials, Infrared optical materials, Chromium oxides.

The objective of this study is to identify and develop revolutionary advanced material suitable for electro-optical/electro-magnetic (EO/EM) windows, IR domes and radomes capable of meeting mission requirements anticipated for the 1990 decade and beyond. Experimental work was directed at synthesis and characterization of the candidate window materials. The toughness enhancement study and the optical modelling continue to indicate the feasibility of toughening of optical materials. In conjunction with known equilibria data, identification was made of the most feasible toughened systems for windowas and enclosures. The most interesting candidates in this category are: (a) cubic stabilized ZrO2/ unstabilized ZrO2; (b) (Al2O3-Cr2O3) solid solution/unstabilized ZrO2, because in both of these cases the index of refraction of the second phase particle is anticipated to match closely that of the matrix. A systematic evaluation of potential new candidates was made and a theory for prediction of low coefficient of thermal expansion crystals was developed. This study indentified, among others, the Beta' sialon ceramics as an important category.

11C. Coating, Colorants, and Finishes

AD-A070 862/8GA PC **A04**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Radioisotope Tracer Technique of Measuring Absorption of Paint Driers by Pigments.
Final rept. Jul 75-Sep 78,
E. S. Matsui. Mar 79, 61p Rept no. CEL-TN-1551

Descriptors: *Paints, *Plastic paints, *Additives, *Adsorption, *Pigments, *Tracer studies, Radioactive isotopes, Drying, Storage, Cobalt compounds, Lead compounds, Manganese compounds, Organometallic compounds, Curing, Life expectancy.
Identifiers: Paint driers.

A sensitive radioisotope tracer technique to measure the amount of paint drier adsorbed on paint pigments has been developed. This technique was found to be very sensitive and precise, and reliability and reproducibility of the procedure were very good. Thee laboratory results indicated that paint driers were adsorbed by pigments during storage, and the amount of adsorption varied among the paints.

GEPP-OP-402 PC **A02**/MF **A01**
General Electric Co., St. Petersburg, FL. Neutron Devices Dept.
Effects of Vacuum Processing Erbium Dideuteride/Dititride Films Deposited on Chromium Underlays on Copper Substrates.
J. L. Provo. 1978, 15p CONF-781130-13
Contract EY-76-C-04-0656
25. national vacuum symposium, San Francisco, CA, USA, 27 Nov 1978.

Descriptors: *Chromium, Copper, *Copper alloys, *Deuterium, *Erbium hydrides, *Targets, Cooling, Fabrication, Heat transfer, Neutrons, Production, Substrates, Surface coating, Thickness, Uranium, Well logging.
Identifiers: ERDA/360201, ERDA/360101, ERDA/440400, Thin films.

For abstract, see ERA citation 04:045140.

11D. Composite Materials

AD-A070 784/4GA PC **A02**/MF **A01**
Army Materials and Mechanics Research Center Watertown MA
Molybdenum-Reinforced Aluminum Oxide Single Crystals.
Final rept.,
James W. McCauley, Frederick Schmid, and Dennis J. Viechnicki. May 79, 15p Rept no. AMMRC-TR-79-23

Descriptors: *Fiber reinforced composites, *Aluminum oxides, *Molybdenum, Wire, Matrix materials, Single crystals, Sapphire, Refractory metals, Crystal growth, Cracks, Thermal expansion.

Molybdenum wire-reinforced aluminum oxide single crystals have been fabricated by the heat exchanger method of seeded unidirectional solidification. No interfacial reaction products were observed and cathodoluminescent evaluation indicated a good diffusion bond. The major problem seems to be thermal expansion mismatch crack networks around the wire. (Author)

AD-A070 951/9GA PC **A06**/MF **A01**
Washington Univ St Louis MO Materials Research Lab
Stress Analysis and Strength Characterization of Thick Composite Laminates.
Final rept.,
Edward M. Wu, King Him Lo, and Richard M. Christensen. May 79, 117p AMMRC-TR-79-29
Contract DAAG46-75-C-0096

Descriptors: *Laminates, *Composite materials, *Composite structures, *Stress analysis, Mathematical models, Plates, Deformation, Stresses, Thickness, Three dimensional, Failure(Mechanics), Fracture(Mechanics), Elastic properties.

This final report covers the theoretical development of and experimental results for the stress analysis and strength characterization of thick composite laminates. Thick composite laminates (consisting of 38 plies or more) are being evaluated for use in future high performance anti-ballistic missiles and other aerospace applications. The theoretical development includes the derivation of a high-order theory of plate deformation which accounts for the effects of transverse shear deformation, transverse normal strain, and a non-linear distribution of the in-plane displacements with respect to the thickness coordinates. The theory is developed for both homogeneous and laminated plates. Further examination of this high-order plate theory via stress solutions which have been carried out to assess its accuracy is reported. This theory, in effect, enables close estimation of three-dimensional stress components from essentially two-dimensional analysis. The effects of the three-dimensional state of stress on the strength of thick laminates are analysed with a 3-D failure criterion. The tensor polynomial method is extended with full account given to three-dimensional stress state effects and is presented together with experiment and evaluation of the coefficients.

AD-A071 067/3GA PC **A02**/MF **A01**
Naval Weapons Center China Lake CA
Thermal Characteristics of 3501-6/AS and 5208/T300 Graphite Epoxy Composites.
Research rept. Feb-Sep 78,
Robert F. Kubin. May 79, 24p Rept no. NWC-TP-6104

Descriptors: *Graphite, *Epoxy resins, *Composite structures, *Composite materials, *Aircraft, Airframes, Activation energy, Heat of formation, Pyrolysis, Degradation, Predictions, Curing, Calorimetry, Thermogravimetric analysis.
Identifiers: Graphite reinforced composites, Epoxy matrix composites.

The thermal characteristics of two graphite epoxy composites for use as aircraft structural components have been investigated. The activation energies and heats of reaction for pyrolysis of the composites were found to be 19.7 kcal/mole and -18.4 cal/g for 3501-6/AS and 25.0 kcal/mole and -20.4 cal/g for 5208/T300, respectively. The kinetic parameters enable prediction of thermal degradation at flight temperatures. In fire fighting, bulk material temperatures must be reduced well below 300 C to prevent continuation of exothermic pyrolysis reactions. It was also found that differential scanning calorimetry provides a more sensitive test of composite cure than reflectance infrared measurements. (Author)

N79-28232/3GA PC **A03**
Boeing Commercial Airplane Co., Seattle, WA.
Environmental Exposure Effects on Composite Materials for Commercial Aircraft.
D. J. Hoffman. Aug 78, 49p NASA-CR-158838, D6-44815-3
Contract NAS1-15148

Descriptors: *Aircraft construction materials, Commercial aircraft, *Composite materials, Exposure, Mechanical properties, Weathering, Accelerated life tests, Graphite-epoxy composite materials, Life (Durability), Reinforcing fibers.
Identifiers: *Carbon fiber reinforced plastics, Graphite reinforced composites, Epoxy matrix composites.

For abstract, see STAR 1719

N79-28233/1GA PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA. Applied Mechanics Div.
A Review of Composite Material Applications in the Automotive Industry for the Electric and Hybrid Vehicle.
Annual Report, Nov. 1978.
J. L. Bauer. 15 Jul 79, 80p NASA-CR-158819, JPL-PUB-79-51
Contract NAS7-100
Subm-Prepared for DOE.

Descriptors: *Automobiles, *Composite materials, Cost reduction, *Electric automobiles, *Technology utilization, Weight reduction, Glass fibers, Graphite, Manufacturing, Plastics, Structural members, Systems engineering.
Identifiers: Reviews, Hybrid systems.

For abstract, see STAR 1719

N79-28234/9GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Thermal-Conductivity Measurements of Tungsten-Fiber-Reinforced Superalloy Composites Using a Thermal-Conductivity Comparator.
L. J. Westfall, and E. A. Winsa. Jul 79, 23p NASA-TP-1445, E-9910

Descriptors: Comparators, *Composite materials, Heat resistant alloys, Reinforcing fibers, Thermal conductivity, Tungsten, Graphs (Charts), High temperature, *Metal matrix composites, Standards, Tables (Data).
Identifiers: Nickel matrix composites, Tungsten reinforced composites, Tungston fibers, Nickel alloy MAR-M-200, Fiber composites.

For abstract, see STAR 1719

N79-28235/6GA PC **A07**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY.
Composite Structural Materials.
Semiannual Progress Report, Oct. 1978 - Apr. 1979.
G. S. Ansell, R. G. Loewy, and S. E. Wiberly. Jul 79, 130p NASA-CR-158851, SAPR-36
Contract NGL-33-018-003
Subm-Sponsored Jointly by NASA and AFOSR.

Descriptors: Aeronautical engineering, *Fiber composites, Technology utilization, Aircraft design, Physical properties, Structural engineering.
Identifiers: Aircraft construction materials.

For abstract, see STAR 1719

11E. Fibers and Textiles

Y/DA-8065 PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
High-Temperature Thermal Insulation.
G. W. Brassell, and G. C. Wai. 23 Feb 79, 4p CONF-790625-1
Contract W-7405-ENG-26
14. carbon conference, University Park, PA, USA, 25 Jun 1979.

Descriptors: Carbon compounds, *Carbon fibers, *Thermal insulation, Binders, Density, Fabrication, Fibers, Pan, Physical properties, Rayon, Size, Thermal conductivity.
Identifiers: ERDA/360301, ERDA/360304.

For abstract, see ERA citation 04:041333.

11F. Metallurgy and Metallography

AD-A070 665/5GA PC **A22**/MF **A01**
Battelle Columbus Labs OH
Collected Engineering Data Sheets (Air Force Data Sheet Program).
Final summary rept. Jun 77-Sep 78,
Omar Deel. Dec 78, 525p AFML-TR-78-179
Contract F33615-77-C-5009

Descriptors: *Steel, *Aluminum alloys, *Titanium alloys, Fatigue(Mechanics), Creep, Chemical composition, Airframes, Test and evaluation, Structural engineering, Data acquisition, Tables(Data), Air Force research.
Identifiers: Data.

The major objectives of this program were to evaluate newly developed materials of interest to the Air Force for potential airframe structural usage, and to provide 'data sheet' type presentations of engineering data for these materials. This report presents a collection of all of the data sheets generated to date on the Air Data Sheet Program. (Author)

AD-A070 677/0GA PC **A03**/MF **A01**
David W Taylor Naval Ship Research and Development Center Annapolis MD Ship Materials Engineering Dept
Galvanic Corrosion of Piping and Fitting Alloys in Sulfide-Modified Seawater.
Research and development rept.,
Harvey P. Hack. May 79, 31p Rept no. DTNSRDC/SME-79-31

Descriptors: *Galvanic corrosion, *Bronze, *Sea water, *Copper nickel alloys, Aluminum, Pipes, Pipe fittings, Sulfides, Pollutants.

Identifiers: Copper alloy 30Ni, Copper alloy 10Ni, Monel.

Two wrought piping alloys, 70-30 and 90-10 copper-nickel, were each galvanically coupled to each of four fitting alloys in sulfide-modified seawater for 30 days. The fitting alloys used were bronze (Composition M), cast Monel, wrought nickel-aluminum bronze, and cast 70-30 copper-nickel. The piping material/fitting material area ratio was 3:1, and the seawater velocity was 2.4 meters per second. Results indicated that the galvanic relationship between M-bronze or Monel and 70-30 copper-nickel is affected by sulfide additions in a manner that increases the corrosion of the fitting material, whereas similar couples with 90-10 copper-nickel show little effect of sulfide.

AD-A070 745/5GA PC **A03**/MF **A01**
Michigan Technological Univ Houghton Dept of Metallurgical Engineering
Fracture Toughness of Widmanstatten Colonies of an Alpha-Beta Titanium Alloy.
Technical rept.,
K. S. Chan, and D. A. Koss. Jun 79, 30p Rept no. TR-9
Contract N00014-76-C-0037

Descriptors: *Titanium alloys, *Fracture(Mechanics), Sheets, Crack propagation, Plane geometry, Stress analysis, Polycrystalline, Plastic properties, Plane geometry, Shear stresses, Microstructure.
Identifiers: Titanium alloy 8Al 1Mo 1V.

The fracture toughness behavior of individual alpha plus Beta Widmanstatten colonies of the Ti-8Al-1Mo-1V alloy in the form of sheet has been investigated. Crack extension occurs predominantly across the Alpha-Beta lamellae under conditions of plane stress and on planes which are inclined both to the thickness and the width of specimens. Polycrystalline material has also been examined and is observed to exhibit fracture along a plane inclined through the thickness but not inclined across the width. Crack-tip plasticity in both types of material is dominated by through-thickness deformation involving slip and often twinning. In the single colony specimens, the crack-tip plasticity has been characterized experimentally by identifying the active slip/twinnning planes and by calculating the distribution of shear stresses on the possible deformation systems, using a maximum, macroscopic shear stress criteria. As suggested by the fracture behavior of the polycrystalline specimens, the macroscopic fracture plane across individual colonies is near that slip or twinning plane which experiences the largest shear stress when the macroscopic shear stress is a maximum.

AD-A070 747/1GA PC **A05**/MF **A01**
Bell Aerospace Textron Buffalo NY
Weldability of Formable Sheet Titanium Alloy - Ti-15V-3Cr-3Al-3Sn.
Final rept. 1 May 77-31 Aug 78,
A. E. Leach, and J. D. McDonough. Dec 78, 85p AFML-TR-78-199
Contract F33615-75-C-5232
See also Rept. no. AFML-TR-76-45, AD-A033 187 AND Rept. no. AFML-TR-77-88, AD-B023 732L.

Descriptors: *Titanium alloys, *Electron beam welding, *Gas tungsten arc welding, *Weldability, Sheets, Vanadium, Chromium, Aluminum, Tin, Mechanical properties, Yield strength, Aging(Materials), Heat treatment.
Identifiers: Titanium alloy 3Al 3Cr 3Sn 15V.

Gas-Tungsten-Arc (GTA) and Electron Beam (EB) fusion welding process parameters were established for Ti-15V-3Cr-3Al-3Sn alloy sheet in 0.050-, 0.100- and 0.300-inch thicknesses. The material, purchased from Timet, was characterized by mechanical testing in the following conditions: solution annealed and solution annealed and aged at 900 and 950 F for eight hours. Solution annealed material is very ductile and formable. Aging response of base metal shows that 150 to 170 ksi minimum yield strengths can be achieved. GTA and EB welds were made using a square butt joint configuration in the 0.050- and 0.100-inch thickness. A 'V' joint configuration was used to weld 0.100-inch thick material wire using the GTA process. 0.300-inch material was welded with the EB process only. All weldments were made using production equipment and there were no anomalies in welding this material. X-ray and dye penetrant tests showed that weldments were crackfree and within porosity limits. Bend and tensile tests made on weldments in the as-welded condition were very ductile and compared favorably to the ductility of solution annealed base metal. Aging response of welded specimens, tensile tested in both longitudinal and transverse directions, was similar to base metal and properties compared favorably to base metal properties. Notched tensile strengths, fracture toughness, and crack growth rates all indicate that Ti-15V-3Cr-3Al-3Sn weldments are satisfactory for structural applications. (Author)

AD-A070 788/5GA PC **A02**/MF **A01**
Michigan Technological Univ Houghton Dept of Metallurgical Engineering
Fracture Along Planar Slip Bands.
Technical rept.,
D. A. Koss, and K. S. Chan. Jun 79, 20p Rept no. TR-10
Contract N00014-76-C-0037

Descriptors: *Nickel alloys, *Titanium alloys, *Aluminum alloys, *Crack propagation, *Fracture(Mechanics), Cracks, Cracking(Fracturing), Mathematical models.

The conditions for propagation of a crack along an inhomogeneous slip band is considered. Allowing slip to occur in the crack plane but restricting the shear displacement to the crack plane results in a relaxed 'elastic-plastic' state of stress near the crack-tip. Calculations of the resulting crack-tip flow behavior indicate that once a crack with a coplanar shear band has formed, it becomes difficult to activate secondary slip with a shear displacement inclined to the crack plane and inhomogeneous slip prevails. The difficulty of activating noncoplanar secondary slip results in large hydrostatic and normal stress near the crack-tip. The combination of large shear strain due to the inhomogeneous shear band and large normal or hydrostatic stresses present near the crack-tip leads to easy crack propagation along such bands. Fracture along slip bands in Ni-, Al-, and Ti-base alloys is briefly discussed in terms of the model. (Author)

AD-A070 798/4GA PC **A03**/MF **A01**
Northwestern Univ Evanston IL Dept of Materials Science
Residual Stresses in Ground Steels.
Technical rept.,
H. Doelle, and J. B. Cohen. 13 Jun 79, 33p Rept no. TR-24
Contract N00014-75-C-0580

Descriptors: *Carbon steels, *Iron, Grinding, *Residual stress, *Shear stresses, Tensile stress, Cooling, Machining, Wear, X ray diffraction.
Identifiers: Armco iron.

A new x-ray method for the evaluation of three dimensional (residual) stress states is demonstrated by studies of the effect of grinding on Armco-iron and a medium carbon steel. Although the penetration depth of the Cr-radiation employed in this study is only 5 microns, there is evidence of residual stresses normal to the surface (normal and shear components). In the past it has been assumed that these stress components can be neglected. Shear stresses normal to the surface are small in Armco iron, but significant (+ or - 60 MPa) in steel. From the sign of the shears, the direction of final grinding can be determined. Cooling decreases the tensile stresses parallel to the surface in steel; surprisingly, the opposite result is found in Armco-iron. (Author)

AD-A070 800/8GA PC **A02**/MF **A01**
Army Materials and Mechanics Research Center Watertown MA
Experimental Evaluation of Peak Height Approximation for X-Ray Diffracted Integrated Intensity Method.
Final rept.,
Charles P. Gazzara. Apr 79, 16p Rept no. AMMRC-TR-79-22

Descriptors: *X ray diffraction, *Powder metals, Diffraction analysis, Bragg angle, Spectrum analysis, Intensity, Peak values, Copper.

A method for characterizing an unresolved characteristic X-ray K sub alpha diffracted powder peak with respect to integrated intensity and Bragg angle has been tested. The method assumes the upper half of the diffracted peak to be Gaussian and the bottom half a Cauchy functional shape to match the experimentally measured diffraction peak. The peak height is used to compute the integrated intensity using calculated relationships. The integrated intensities of the Cuk sub alpha (111) and (200) X-ray diffracted peak doublets were measured from silicon powders employing variations in beam and receiving slit widths on commercial X-ray units and compared with the calculated intensities. This method offers promise as a fast and accurate technique as demonstrated by its ability to measure X-ray intensities to a precision of several percent under selective experimental conditions. (Author)

AD-A070 860/2GA PC **A03**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Development of Supercorroding Alloys for Use as Timed Releases for Ocean Engineering Applications.
Final rept. Oct 77-Sep 78,
S. A. Black. Mar 79, 40p Rept no. CEL-TN-1550

Descriptors: *Magnesium alloys, *Corrosion, *Sea water, Gas generating systems, Hydrogen, Heat, Linkages, Chemical reactions, Time, Release mechanisms, Cathodes, Iron, Nickel.

A family of supercorroding magnesium alloys that react spontaneously and vigorously with seawater have been developed at CEL. Supercorroding alloys are so named because of their high corrosion rate in seawater. Investigations of several different alloy formulations show that the alloys can be useful for generation of hydrogen for ocean buoyancy, fuel for thermodynamic engines and fuel cells, production of heat for divers and as self-destructing links for retrieval of oceanographic instruments. Supercorroding alloys with magnesium as the anode material and with several different cathode materials were fabricated and tested to determine mechanical and corrosive characteristics. Alloys with 5 atomic percent iron cathode produce 950 ml of hydrogen per gram of alloy and 13.3 K joules of heat per gram. One gram is over 90% reacted within one minute from immersion. Compacting and sintering produces samples with 9 ksi shear and tensile strengths. Corrosion rates for sintered samples are approximately .009 inches per hour. Alloys with other cathode materials and different levels of cathode content were fabricated and tested. Sufficient data is available on several different formulations of supercorroding alloys to permit preliminary selection for specific applications. (Author)

AD-A070 906/3GA PC **A03**/MF **A01**
Carnegie-Mellon Univ Pittsburgh PA Dept of Metallurgy and Materials Science
Phase Transformations in Ti Alloys - A Review of Recent Developments.
Technical rept.,
J. C. Williams. Oct 78, 26p Rept no. JWTR-4
Contract N00014-76-C-0409

Descriptors: *Titanium alloys, *Phase transformations, Martensite, Phase studies, Nucleation, Growth(General), Order disorder transformations, Microstructure, Electron microscopy.

The phase transformations in Ti alloys are reviewed. This review augments earlier reviews and emphasizes several transformations which have recently received attention. These include athermal omega-phase formation, martensitic transformations, nucleation and growth decomposition of the beta-phase, the ordering reaction in hcp and bcc Ti alloys and the effects of processing history on microstructure. (Author)

AD-A070 936/0GA PC **A06**/MF **A01**
Rockwell International Thousand Oaks CA Science Center
NDE Method for Characterizing Anodized Al Surfaces.
Final rept. 1 Sep 77-31 Jul 78,
T. Smith. Sep 78, 113p SC5123.23FTR, AFML-TR-78-146
Contract F33615-77-C-5215

Descriptors: *Aluminum alloys, *Anodic coatings, *Contaminants, *Nondestructive testing, Ellipsometers, *Adhesive bonding, Phosphoric acids,

Curves(Geometry), Mapping, Computer applications.
Identifiers: Aluminum alloy 7075, Polarimetery.

This report describes a study of the relationship between nondestructive inspection (NDI) for contaminants on phosphoric acid anodized (PAA) A1 7075-T6 and bond strength and degradation that results from the contamination. Contamination is used in the broad sense to include surface preparation process errors (e.g., incorrect anodize time or voltage) and handling damage, as well as organic contamination from humans and smog. It is demonstrated that the ellisometric technique can adequately reveal contamination at levels below and in the range that significantly degrades bond integrity. The ellisometric technique is not restricted to flat panels, as demonstrated by mapping a panel with 7 cm radius of curvature. However, mapping of curved surfaces would be facilitated by passing the sensor head over the panel rather than the panel under the head. This and mapping on NDI of smaller numbers of various shaped parts requires the development of a small miniaturized hand-held contamination tester. The design of such a tester is presented. (Author)

AD-A070 994/9GA PC **A07**/MF **A01**
Nottingham Univ (England) Dept of Metallurgy and Materials Science
Metallurgical Changes in the High Temperature Fretting of Ni and Ti Alloys.
Final technical rept.,
R. B. Waterhouse, and M. M. Hamdy. Feb 79, 149p
Contract DAJA37-75-R-0649

Descriptors: *Titanium alloys, *Nickel alloys, *Superalloys, *Fatigue(Mechanics), *Fretting, High temperature, Strength(Mechanics), Wear, Microstructure, Heat resistant alloys, Glazes, Oxides, Great Britain.
Identifiers: *Foreign technology, Titanium alloy 6Al/4V, Nickel alloy Inconel 718.

The report describes an investigation into the fretting-fatigue and fretting wear of two materials: Ti-6Al-4V, of which there were two supplies from different sources - IMI and AMMRC, and Inconel 718 supplied by AMMRC. Tests were carried out in normal air at temperatures up to 600 C in the case of the IMI Ti-6Al-4V, and up to 700 C in the case of the Inconel 718.

BNL-26132 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Hydrogen Diffusion and Trapping in BCC and FCC Metals.
D. Richter. 1979, 19p
Contract EY-76-C-02-0016

Descriptors: *Copper, *Deuterium, *Hydrogen, *Nickel, *Niobium, *Palladium, *Tantalum, *Tritium, *Vanadium, Activation energy, Diffusion, Lattice parameters, Sorptive properties.
Identifiers: ERDA/360104, ERDA/360102.

For abstract, see ERA citation 04:043410.

CONF-790219-6 PC **A03**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Corrosion of Copper--Zinc and Copper--Nickel Alloys in a Geothermal Brine.
R. L. Miller. 1978, 46p
Contract EY-76-C-07-1570
AIME annual meeting, New Orleans, LA, USA, 18 Feb 1979.

Descriptors: *Brass, *Brines, *Copper, *Copper alloys, *Geothermal fluids, *Nickel alloys, *Zinc alloys, *Corrosion, Corrosion resistance, Corrosive effects, Reaction kinetics, Sulfides.
Identifiers: ERDA/150903.

For abstract, see ERA citation 04:042804.

COO-3158-70 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY.
Direct Observation of the Vacancy Structure of Depleted Zones in Tungsten Ion Irradiated at 10 exp 0 K.
C. Y. Wei, and D. N. Seidman. Dec 78, 13p
Contract EY-76-S-02-3158

Descriptors: *Tungsten, Chromium ions, Molybdenum ions, Physical radiation effects, Point defects, Tungsten ions, Vacancies.
Identifiers: ERDA/360106, ERDA/360102, Ion irradiation.

For abstract, see ERA citation 04:043428.

N79-28288/5GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
Study of Austenitic Stainless Steel Welded with Low Alloy Steel Filler Metal.
F. A. Burns, and R. A. Dyke, Jr. Jun 79, 32p
NASA-TP-1460

Descriptors: Alloys, *Austenitic stainless steels, Fillers, Impact strength, Tensile strength, Weld tests, Chemical composition, Chromium alloys, Corrosion, Corrosion prevention, Nickel alloys, Nitriles, Powdered aluminum.
Identifiers: *Welded joints, Steel 316-L, Low alloy steels, Filler metal.

For abstract, see STAR 1719

N79-28625/8GA PC **A03**/MF **A01**
Central Electricity Generating, Leatherhead (England). Central Electricity Research Labs.
Fracture Toughness and Slow Crack Growth in Austenitic Stainless Steels and Weldments.
J. R. Haigh. 14 Sep 78, 30p CEGB/LM/MATS-220

Descriptors: *Austenitic stainless steels, *Crack propagation, *Fracture strength, *Welded joints, Brittleness, Ductility, Residual stress.
Identifiers: Toughness.

For abstract, see STAR 1719

ORNL/TM-6822 PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Creep Behavior of Hastelloy X, 2 1/4 Cr--1 Mo Steel, and Other Alloys in Simulated HTGR Helium.
H. E. McCoy, Jr. Jun 79, 58p
Contract W-7405-ENG-26

Descriptors: *Chromium alloys, *Chromium-molybdenum steels, *Hastelloy x, *Inconel 617, *Iron alloys, *Molybdenum alloys, *Nickel alloys, *Titanium base alloys, Creep, Htgr type reactors, Testing.
Identifiers: ERDA/360103, ERDA/210300, Nickel alloy Hastelloy X, Nickel Alloy Inconel 617, Steel 2.25 Cr 1Mo.

For abstract, see ERA citation 04:043402.

PB-298 650/3GA Not available NTIS
National Bureau of Standards, Washington, DC.
Low-Temperature Fracture Properties of a USSR Aluminum-6% Magnesium Alloy.
Final rept.,
H. I. McHenry, S. E. Naranjo, D. T. Read, and R. P. Reed. 1978, 10p
Pub. in Proceedings of the International Cryogenic Materials Conference (2nd) Held at Boulder, CO. on August 3-5, 1977, p519-528, 1978.

Descriptors: *Aluminum alloys, Magnesium containing alloys, Cryogenics, Crack propagation, Fatigue(Materials), Toughness, Fracture tests, USSR.
Identifiers: *Foreign technology, Aluminum alloy 5083, Aluminum alloy 4.5Mg, Aluminum alloy 6Mg.

Aluminum alloy 5083-0 (Al-4.5Mg) is widely used in the United States as a construction material for liquefied natural gas (LNG) containers and other cryogenic applications. In the USSR, aluminum alloy AMg6-0 (Al-6Mg) has been developed for similar applications. As a part of the U.S.-USSR LNG materials exchange program, NBS was asked to evaluate the fracture properties of the AMg6 alloy supplied by the USSR and to compare the results with those obtained previously on the 5083-0 alloy. The results of fatigue crack growth and fracture toughness tests are summarized in this paper.

PB-298 651/1GA Not available NTIS
National Bureau of Standards, Washington, DC.
Standard Reference Materials for Thermophysical Properties.
Final rept.,
J. G. Hust, and R. K. Kirby. 1978, 8p
Pub. in Proceedings of the International Cryogenic Materials Conference (2nd) Held at Boulder, CO. on August 3-5, 1977, p232-239, 1978.

Descriptors: Thermal properties, Specific heat, Thermal conductivity, Thermal expansion, Vapor pressure, Elastic properties, Electrical resistivity, Emittance, Standards, Materials, Aluminum, Copper, Gold, Iron, Tungsten, Aluminum oxide, Silicon dioxide, Glass, Heat resistant alloys.
Identifiers: *Standard reference materials, Temperature scales.

The National Bureau of Standards has prepared over 50 certified Standard Reference Materials (SRM's) for use in the area of thermophysical properties of solids. The properties that have been certified include elasticity, electrical resistivity, emittance, specific heat, thermal conductivity, thermal expansion, vapor pressure, and both defining and secondary fixed points of the International Practical Temperature Scale, IPTS-68. The materials, stocked by NBS-OSRM, whose property(ies) have been certified include aluminum, copper, gold, iron, tungsten, several high-temperature alloys, alumina, silica, and several glasses. A discussion is presented of those SRM's most applicable to low-temperature measurements. The significance of SRM's to the national measurement system is discussed along with desirable qualities of SRM's and their applications. The work in progress and future plans of this program are also presented.

PB-298 756/8GA Not available NTIS
National Bureau of Standards, Washington, DC.
Elastic Constants at Low Temperatures: Recent Measurements on Technological Materials at NBS.
Final rept.,
H. M. Ledbetter. 1978, 17p
Sponsored in part by Maritime Administration, Washington, DC., National Aeronautics and Space Administration, Washington, DC., and Advanced Research Projects Agency, Arlington, VA.
Pub. in Proceedings Int. Cryogenic Materials Conf. (2nd), Held at Boulder, CO. on Aug 3-5, 1977. Paper in Advances in Cryogenic Engineering, v24 p103-119, 1978.

Descriptors: *Aluminum alloys, *Copper alloys, *Titanium alloys, *Steels, *Composite materials, Cryogenics, Low temperature research, Niobium alloys, Fiberglass reinforced plastics, Elastic properties, Modulus of elasticity, Poisson ratio.
Identifiers: *Elastic constants, Epoxy matrix composites, Metal matrix composites.

Low-temperature (4-300 K) elastic constants determined experimentally at NBS during the last four years are reviewed. Forty-seven technological materials were studied, including: aluminum alloys, cupro-nickels, titanium alloys, titanium-niobium superconducting alloys, copper-base precipitation-hardening alloys, invar, inconels, maraging steel, nickel steels, stainless steels, nitronics, and the composites -- fiberglass/epoxy, NbTi/Cu epoxy, NbTi/Cu, and B/Al. Elastic constants discussed primarily are: Young's modulus, the shear modulus, the bulk modulus, and Poisson's ratio.

PB-298 812/9GA PC **A02**
Hawaii Univ., Honolulu.
Sulfation of Ferromanganese Nodules: A Route to the Selective Separation of Some Economically Valuable Metals,
Jong H. Lee, John Gilje, Harry Zeitlin, and Stephen J. Kirchner. 1979, 14p UNIHI-SEAGRANT-CP-79-02, NOAA-79070912
Pub. in unidentified Jnl.

Descriptors: *Manganese nodules, *Sulfation, Ferromanganese, Copper, Nickel, Cobalt, Manganese, Separation, Molybdenum, Sublimation.
Identifiers: Sea Grant program, Reprints.

The results of an investigation on the sulfation of the ferromanganese nodules in the temperature range of 300 degrees-600 degrees C under varying conditions are described. As a result of the study a process is developed by which Cu, Ni, Co, and Mn can be virtually quantitatively extracted from the sulfated nodules. Molybdenum, present in all marine manganese nodules at low concentration (0.02%-0.07%), is also commercially important. The process also allows Mo to be effectively

separated by sublimation from the solid nodules. Also included in this report are results of a study of the effect of a number of reaction parameters on the sulfation and sublimation of Mo.

PB-298 871/5GA PC **A02**
Hawaii Univ., Honolulu. Dept. of Chemistry.
Recovery of Metals from Deep Sea Ferromanganese Nodules,
Stephen J. Kirchner, James Dyke, Ann C. Stiff, Quintus Fernando, and Harry Zeitlin. 1979, 15p
UNIHI-SEAGRANT-CP-79-01, NOAA-79070911
Grant NOAA-04-7-158-44129
Pub. in Hawaii University Sea Grant Reprint No. UNIHI-SEAGRANT-CP-79-01, 12p. Prepared in cooperation with Arizona Univ., Tucson. Dept. of Chemistry.

Descriptors: *Manganese nodules, *Leaching, Manganese, Copper, Iron, Nickel, Cobalt, Sulfuric acid, Oxalic acid, Ferromanganese, X ray spectroscopy, Separation.
Identifiers: Sea Grant program, Reprints.

The reducing conditions and the solubilization of nodules have been simulated in a bench scale process. The concentrations of a number of minor components have been determined at each stage of the process in an attempt to understand the chemical reactions that occur between these minor components and the reagents that were used. Thirty-seven elements were identified in the ferromanganese nodules by the proton induced X-ray emission technique. The technique, which is described, can be used to follow the distribution of all these elements in the various solid and liquid phases in the flow diagram. Although the main concern in this work has been in following the distribution of Cu, Ni, Co, Fe and Mn in the various phases in the separation scheme, the utility of a multielemental analytical technique such as proton induced X-ray emission spectroscopy for following the distribution of the elements of interest at various stages in the separation scheme was demonstrated.

SAND-79-0922C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Observations of the Vacuum Arc and Metal Transfer During Vacuum Consumable Arc Remelting.
F. J. Zanner. 1979, 11p CONF-790442-8
Contract AC04-76DP00789
International conference on metallurgical coatings, San Diego, CA, USA, 23 Apr 1979.

Descriptors: *Maraging steels, Electrodes, Mass transfer, Melting, Surfaces.
Identifiers: ERDA/360101, Vacuum melting, Consumable electrode process.

For abstract, see ERA citation 04:039095.

UCRL-13989 PC **A04**/MF **A01**
Northeastern Univ., Boston, MA.
Development and Initial Characterization of Amorphous Metals Rich in W and/or RE.
B. C. Giessen, and D. E. Polk. 1978, 58p
Contract W-7405-ENG-48
Portions of this document are illegible.

Descriptors: *Niobium alloys, *Iridium alloys, *Actinide alloys, *Manganese alloys, *Iron alloys, *Cobalt alloys, *Gallium alloys, *Cobalt borides, *Rhodium borides, *Iridium borides, *Tantalum borides, *Rhenium borides, *Rhenium silicides, Amorphous state, Crystal-phase transformations, Crystallization, Electric conductivity, Fabrication, Fracture properties, Glass, Melting, Phase diagrams, Quenching, Recrystallization, Refractories, Rhodium alloys, Tantalum alloys, Tungsten borides.
Identifiers: ERDA/360101, ERDA/360201, ERDA/360601.

For abstract, see ERA citation 04:041200.

11G. Miscellaneous Materials

NTIS/PS-79/0833/8GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Ablation and Ablative Materials (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Aug 79, 49p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Ablation, *Ablative materials, *Bibliographies, Heat shielding, Atmospheric entry, Meteorites, Reentry vehicles, Heat transfer, Abstracts.

This bibliography of citations to the international literature concerns various aspects of ablation and ablative materials. Included are articles covering aerodynamic heating, heat shielding, radiative heat transfer, atmospheric entry, reentry effects, reentry shielding, and reentry vehicles. Ablation of meteorites is also covered. Articles concerning various ablative materials are included. (Contains 200 citations)

11H. Oils, Lubricants, and Hydraulic Fluids

BETC/RI-79/7 PC **A02**/MF **A01**
Department of Energy, Bartlesville, OK. Bartlesville Energy Technology Center.
Predictive Test Method for Coking and Fouling Tendency of Used Lubricating Oil.
G. L. Steele, D. W. Brinkman, and M. L. Whisman. May 79, 16p

Descriptors: *Lubricating oils, *Waste oils, Ashes, Coking, Performance testing, Pyrolysis, Stability.
Identifiers: ERDA/023000, ERDA/020800.

For abstract, see ERA citation 04:042316.

N79-28315/6GA PC **A05**/MF **A01**
IIT Research Inst., Chicago, IL.
Program for Plasma-Sprayed Self-Lubricating Coatings.
Final Report.
G. C. Walther. Jul 79, 81p NASA-CR-3163, D6146
Contract NAS3-20827

Descriptors: Plasma spraying, *Self lubricating materials, *Solid lubricants, Composite materials, Heat treatment, Inorganic compounds, Powder metallurgy, *Sprayed coatings, Temperature distribution.

For abstract, see STAR 1719

N79-28554/0GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Elastohydrodynamic Film Thickness Measurements of Artificially Produced Nonsmooth Surfaces.
C. Cusano, and L. D. Wedeven. 1979, 47p
NASA-TM-79214, E-9977
Conf-Proposed for Presentation at Joint Lubrication Conf., Dayton, Ohio, 16-18 Oct. 1979; Sponsored by AM. Soc. Of Lubrication Engr. And the ASME.

Descriptors: Elastohydrodynamics, *Film thickness, *Lubrication, Surface roughness, Interferometry, Optical measurement, Pressure, Topography.

For abstract, see STAR 1719

11I. Plastics

AD-A070 541/8GA PC **A06**/MF **A01**
Air Force Materials Lab Wright-Patterson AFB OH
Isothermal Weight Loss and Life Expectancy Curves of Polymers in Air.
Final rept. May 74-Jan 78,
Gerhard F. L. Ehlers. Jun 78, 109p Rept no. AFML-TR-78-63

Descriptors: *Polymers, *Aging(Materials), *Isotherms, Test equipment, Sampling, Temperature measuring instruments, Weight reduction, Life expectancy, Curves(Geometry).

Sixty-five polymers have been subjected to isothermal aging in air for up to 200 hours at one or several temperatures of 500, 550, 600, 650, 700, and 750 F and the weight loss-time curves plotted. The data have been used to obtain life expectancy plots for 20 and for 30% weight loss. (Author)

AD-A070 670/5GA PC **A03**/MF **A01**
Case Western Reserve Univ Cleveland OH Dept of Macromolecular Science
Relationships Between Mechanical Behavior and Craze Morphology in Thin Films of Polystyrene.
Interim rept.,
J. S. Trent, I. Palley, and E. Baer. 20 Jun 79, 39p Rept no. TR-9
Contract N00014-75-C-0795

Descriptors: *Polystyrene, *Polymeric films, *Mechanical properties, *Crazing, Thin films, Strain rate, Stress strain relations, Thermal properties, Annealing, Electron microscopy, Microstructure.

A new technique has been developed to study the relationship between mechanical properties and craze microstructure in thin films (1-10 micrometers of polystyrene. These thicknesses allowed us to strain the films in a conventional testing machine and subsequently examine them in the deformed state in an electron microscope. Strain rate was systematically varied and its effect was investigated on both quenched and annealed samples correlations were found between craze morphology and ductility. A new 'craze parameter' fundamental to our theoretical interpretation has been defined as the width of a strip of material which is involved in the development of a craze. 0From this value, the average strain and the average volume fraction of fibrils within a craze can be calculated. In order to obtain a mechanistic model which is consistent with observed data, a changing relative local strain rate during craze formatior had to be assumed. (Author)

AD-A070 674/7GA PC **A02**/MF **A01**
Case Western Reserve Univ Cleveland OH Dept of Macromolecular Science
Ferroelectric Polymers.
Final rept. 1973-1976,
Morton H. Litt. 1 Jun 79, 13p
Contract N00014-67-A-0404-0011

Descriptors: *Polymers, *Benzimidazoles, *Ferroelectric materials, *Nylon, Antiferroelectricity, Pyroelectricity, Polyimide resins, Ferroelectricity.
Identifiers: Nylon 11.

Polybenzimidazoles were studied as potential ferroelectric polymers after a model, 2-ethylbenzimidazole, was shown to be ferroelectric. Three polymers were studied as the formate salts. They were interesting and showed large polarization, but were not pyroelectric or ferroelectric. One polymer may be antiferroelectric with T(c) = 40 C. Nylon 11 was shown to be polable and was then pyroelectric. (Author)

AD-A070 768/7GA PC **A02**/MF **A01**
National Measurement Lab Washington DC Polymer Science and Standards Div
Ferroelectric Polarization in Polymers.
Technical rept.,
Martin G. Broadhurst, and G. Thomas Davis. Jun 79, 19p Rept no. TR-13
Contract N00014-79-C-0012

Descriptors: Polyvinylidenes, Fluoropolymers, *Ferroelectricity, *Polarization, *Mathematical models, Hysteresis, Light transmission, Infrared radiation, Crystals, Ferroelectric crystals.
Identifiers: *Vinylidene fluoride polymers.

A cooperative model has been developed to describe ferroelectric polarization in polyvinylidene fluoride (PVDF). The molecular dipoles within the crystal are assumed to have two or more orientations available to them and the lattice energy of a given orientational site is assumed to be proportional to the fraction of molecules having that orientation. An analytical solution is given for the 2-site model which predicts polarization hysteresis typical of ferroelectrics. However, a more complex 6-site model, which can be analysed numerically, is needed to account for observed infra red hysteresis data and electric-field-induced x-ray structural changes which have been reported for PVDF. Although the model is simple, rather complex behavior is observed including a gradual increase or decrease in the remnant polarization with number of cycles of electric field application. Though the agreements with various experimental data are good an obvious need to include kinetic effects in the model is indicated. (Author)

AD-A070 808/1GA PC **A04**/MF **A01**
National Measurement Labs Washington DC Polymer Science and Standards Div
Piezo and Pyroelectric Properties of Electrets.
Technical rept.,
M. G. Broadhurst, and G. T. Davis. Jun 79, 74p
Rept no. TR-10
Contract N00014-79-C-0012

Descriptors: *Electrets, *Piezoelectric materials, *Pyroelectricity, Thin films, Polyvinyl chloride, Fluorides, Polyvinylidenes, Ferroelectricity, Dipole moments, Alignment, Space charge, Electronic switching, Crystal structure, Relaxation, Kerr magnetooptical effect.
Identifiers: Polyvinyl fluoride, Polyvinylidene fluoride.

Electrets with piezoelectric and pyroelectric properties can be made from thin polymer films which have the desirable properties of being flexible, strong, and light weight. The properties of electrets composed or oriented molecular dipoles in both amorphous and semicrystalline polymers are compared with monopolar electrets formed by frozen-in real charge. Models and concepts are presented which allow piezoelectric and pyroelectric response to be predicted from material properties. a two-site model of dipole alignment involving cooperativity leads to predictions for ferroelectric switching in polymers with a polar crystal form. Experimental results are reviewed and compared with predictions from the model. (Author)

AD-A070 822/2GA PC **A03**/MF **A01**
National Measurement Lab Washington DC Polymer Science and Standards Div
Fabrication of Piezoelectric Polymer Film.
Technical rept.,
James M. Kenney, Steven C. Roth, and Martin G. Broadhurst. Sep 78, 28p Rept no. TR-12
Contracts N00014-79-C-0012, MIPR-N66000177MP50030

Descriptors: *Polyvinylidenes, *Fluoropolymers, Films, *Piezoelectricity, *Pyroelectricity, Piezoelectric materials, Polymers, Polarization, Transducers.

High values of pyroelectric and piezoelectric activity in fully electroded films of poly(vinylidene fluoride) were obtained by 'conventional' (noncorona) poling at room temperature with sufficiently high fields. The avoidance of breakdown while obtaining high activity requires an understanding of the time dependence of both breakdown and activity. Time-to-breakdown as a function of field, and room temperature pyroelectric activity (7-14 days after poling at 23-1/2 deg C) as a function of poling time and field were obtained for 25-micrometer biaxially stretched films with evaporated aluminum electrodes. The highest activities were obtained by poling at the highest fields and poling to breakdown. A pyroelectric activity of 36/micro-CK sq m was measured two weeks after poling. The highest activity obtained with no apparent breakdown (31/micro-CK sq m) was measured a week after poling. These values are comparable with the highest that have been reported for this material using any poling temperature or using corona poling.

BNL-50955 PC **A03**/MF **A01**
Brookhaven National Lab., Upton, NY.
Polyketones and Polysulfones for Conservation in the Ethylene Polymer Industry. Progress Report No. 2, April--September 1978.
R. Johnson. Dec 78, 44p
Contract EY-76-C-02-0016

Descriptors: *Plastics industry, *Polyethylenes, Carbon monoxide, Chemical radiation effects, Cobalt 60, Electron beams, Energy conservation, Gamma radiation, Ketones, Organic polymers, Polymerization, Production, Research programs, Resource conservation, Sulfones, Sulfur dioxide.
Identifiers: ERDA/320302, ERDA/320303.

For abstract, see ERA citation 04:043316.

BNL-50984 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Polyketones and Polysulfones for Conservation in the Ethylene Polymer Industry. Progress Report No. 3, October--December 1978.
R. Johnson. Dec 78, 19p
Contract EY-76-C-02-0016

Descriptors: *Plastics industry, *Polyethylenes, Carbon monoxide, Catalysts, Chemical radiation effects, Cobalt 60, *Energy conservation, Gamma radiation, Ketones, Organic polymers, Polymerization, Production, Research programs, Resource conservation, Sulfones.
Identifiers: ERDA/320302, ERDA/320303, Chemical properties, Physical properties.

For abstract, see ERA citation 04:043317.

SAND-79-0894C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Accelerated Aging of Parachute Materials.
J. A. Wagner, K. E. Mead, I. Auerbach, and R. H. Ericksen. 1979, 6p CONF-790632-3
Contract AC04-76-DP00789
JOWOG-28, Albuquerque, NM, USA, 11 Jun 1979.

Descriptors: *Aramids, *Nylon, *Parachutes, *Weapons, Aging, Performance, Tensile properties.
Identifiers: ERDA/360403.

For abstract, see ERA citation 04:043463.

11J. Rubbers

BDX-613-2157(Rev.) PC **A02**/MF **A01**
Bendix Corp., Kansas City, MO.
Improving Bondability to RTV Silicone Elastomer Using RF-Activated Gas.
J. L. Bellah. May 79, 24p
Contract EY-76-C-04-0613

Descriptors: *Elastomers, Adhesion, Bonding, Silicones.
Identifiers: ERDA/360401.

For abstract, see ERA citation 04:045153.

NUREG/CR-0834 PC **A02**/MF **A01**
General Electric Co., San Jose, CA. Nuclear Energy Engineering Div.
Reactor Primary Coolant System Pipe Rupture Study Method for Detection of Sensitization in Stainless Steel.
Progress rept. no. 46, Oct-Dec 78,
W. L. Clarke. Aug 79, 23p GEAP-10207-46
Contract NRC-04-75-202
See also Rept. no. 45, PB-293 412.

Descriptors: *Stainless steels, *Nondestructive tests, Nuclear reactor materials, Cooling systems, Stress corrosion, Electrochemistry, Welded joints, Corrosion resistance.
Identifiers: *Electrochemical potentiokinetic reactivation, Steel 304, Steel 304-L.

A program is in progress to develop a quantitative method (Electrochemical Potentiokinetic Reactivation (EPR)) for nondestructively measuring the degree of sensitization in Type-304 and -304L stainless steels. The technique has been extended to characterize weld heat-affected zones and to correlate degree of sensitization with intergranular stress corrosion cracking resistance. Current studies are directed toward establishing procedures for, and qualifying, a technique to obtain EPR measurements in-situ on reactor components in the field.

N79-28314/9GA PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Development and Evaluation of Elastomeric Materials for Geothermal Applications.
Annual Report, Oct. 1977 - Dec. 1978.
W. A. Mueller, S. H. Kalfayan, W. W. Reilly, A. H. Yavrouian, and I. D. Mosesman. 15 May 79, 45p
NASA-CR-158813, JPL-PUB-79-40
Contract NAS7-100
Subm-Prepared for NASA and DOE.

Descriptors: *Copolymers, *Elastomers, *Geothermal energy conversion, *Mechanical properties, *Polymerization, Graphs (Charts), Polystyrene, Quinoxalines.
Identifiers: Geothermy, Heat resistant materials, Stability, Synthesis(Chemistry).

For abstract, see STAR 1719

SAND-79-0158C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Morphology of Rubber Modified Epoxy Encapsulants.
J. A. Sayre. 1979, 12p CONF-790518-5
Contract EY-76-C-04-0789
10. US/UK symposium on neutron generators, Albuquerque, NM, USA, 21 May 1979.

Descriptors: *Epoxides, *Rubbers, Encapsulation, Interfaces, Morphology, Osmium, Particle size, Spheres, Thermal cycling.
Identifiers: ERDA/360302.

For abstract, see ERA citation 04:041334.

SAND-79-0605c PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Accelerated Thermal Aging of Rubber Modified Epoxy Encapsulants.
J. A. Sayre. 1979, 14p CONF-790518-4
Contract EY-76-C-04-0789
10. US/UK symposium on neutron generators, Albuquerque, NM, USA, 21 May 1979.

Descriptors: *Epoxides, *Rubbers, *Aging, Density, Encapsulation, Physical properties, Spheres, Tensile properties.
Identifiers: ERDA/360304, ERDA/360303, Thermal degradation.

For abstract, see ERA citation 04:041336.

11K. Solvents, Cleaners, and Abrasives

BDX-613-2133 PC **A03**/MF **A01**
Bendix Corp., Kansas City, MO.
Chemical Characterization of a Mixed (Orthophosphoric/Polyphosphoric) Acid Aluminum Etchant.
H. Win, and T. J. Morin. Jan 79, 29p CONF-790618-1
Contract EY-76-C-04-0613
66. annual AES conference and exhibit of industrial finishing, Atlanta, GA, USA, 24 Jun 1979.

Descriptors: *Aluminium, *Iron chlorides, *Phosphoric acid, *Printed circuits, Chemical properties, Electric cables, Etching, Fabrication, Sensitivity, Surface coating.
Identifiers: ERDA/360101, *Etchants, Photolithography.

For abstract, see ERA citation 04:041197.

11L. Wood and Paper Products

PB-298 735/2GA PC **A02**/MF **A01**
Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.
Predicting Softwood Cutting Yields by Computer.
Forest Service research paper (Final),
Bernard J. Erickson, and Donald C. Markstrom. Dec 72, 21p FSRP-RM-98

Descriptors: *Woodworking, *Softwoods, Cutting, Yield, Computer programs, Fortran.
Identifiers: PERMU computer program, CONST computer program, RECVRY computer program, DEFEDIT computer program, CTDFCT computer program, CUTUP system.

A set of Fortran programs predicts the maximum yield of cuttings for softwood cut-up and edge- and end-gluing operation. The program calculates cutting recovery (given cutting width and length constraints and defect locations on the board), and locates ripping saw kerfs.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A070 582/2GA PC **A03**/MF **A01**
Naval Air Test Center Patuxent River MD
Multidimensional Quadrature Formulas using Partial Derivates.
Technical memo. Oct 76-31 Oct 77,
Wayne E. Hoover, and J. Sutherland Frame. 25 May 79, 40p Rept no. NATC-TM-78-2-CS

Descriptors: *Numerical integration, *Numerical quadrature, Corrections, Accuracy, Functional analysis, Matrices(Mathematics).
Identifiers: Partial derivatives.

Conventional multidimensional quadrature formula employ a weighted sum of function values to approximate a multiple integral over a hyperrectangle. This paper considers the problem of enhancing the traditional formulas by the addition of certain partial derivative correction terms evaluated on the boundary of the domain of integration. Numerical results for double and triple integrals indicate the formulas of degrees of precision 3 and precision 5 are both accurate and efficient. (Author)

AD-A070 641/6GA PC **A02**/MF **A01**
California Univ San Diego La Jolla Dept of Applied Physics and Information Science
Discrete-Time Spectral Estimation of Continuous-Time Processes - the Orthogonal Series Method (Spectral Estimation by Orthogonal Series),
Elias Masry. 1 Apr 79, 18p
Contract N00014-75-C-0652

Descriptors: *Poisson density functions, Series(Mathematics), *Time series analysis, Spectrum analysis, Convergence, Estimates, Orthogonality, Kernel functions, Statistical samples, Covariance.

Let X = (X(t), - infinity < t < infinity) be a stationary time series with spectral density function phi(lambda). Let (t sub n) be a stationary poisson point process on (- infinity, infinity), independent of X. The existence of consistent estimates of phi(lambda) based on the discrete-time observations (X(t sub n)), when the actual sampling instants (t sub n) are not known, has been an open question. Using an orthogonal series method, a class of spectral estimates is considered and its uniform and integratedly uniform consistency in quadratic mean is established. The rates of convergence are determined and compared with those of the kernel-type estimates based on the observations (X(t sub n), t sub n). (Author)

AD-A070 660/6GA Not available NTIS
Jewish Hospital of Brooklyn NY
A Comparison of Computational Methods and Algorithms for the Complex Gamma Function,
Edward W. Ng. Nov 72, 15p
Grant NSF-AG-499
Presented at Mathematical Software II, a Conference Held at Purdue Univ., Lafayette, IN, 29-31 May 74.
Availability: Pub. in ACM Transactions on Mathematical Software, v1 n1 p56-70 Mar 75. (No copies furnished by DDC).

Descriptors: Algorithms, Special functions(Mathematical), Subroutines, Computations, Complex variables, Reprints.
Identifiers: *Gamma function.

No abstract available.

AD-A070 667/1GA PC **A02**/MF **A01**
University of Southern California Los Angeles Dept of Electrical Engineering
A Multiloop Generalization of the Circle Stability Criterion,
Michael G. Safonov, and Michael Athans. 1978, 10p AFOSR-TR-79-0639
Contract F44620-76-C-0061, Grant NSF-ENG78-05628
Sponsored in part by Grants NsG 1312 and NGL-22-009-124. Pub. in Proceedings of the Annual Asilomar Conference on Circuits, Systems and Computers (12th), p1-9 6-8 Nov 78.

Descriptors: *Computer programming, *Control theory, Stability, Loops, Feedback, Reprints.
Identifiers: Nyquist diagrams.

No abstract available.

AD-A070 821/4GA PC **A03**/MF **A01**
Center for Naval Analyses Arlington VA Operations Evaluation Group
Modeling Fluctuations in Macroscopic Systems,
Professional paper,
Marc Mangel. Apr 79, 31p Rept no. OEG-PP-250

Descriptors: *Mathematical models, Differential equations, *Stochastic processes, Random variables, Dynamics, Population(Mathematics), Oscillators.

Macroscopic systems are often modeled by deterministic differential equations (DDE), such as x-dot=f(x,t). Here, x(t) is a macrovariable and represents an average over some set of ensembles. A possible extension of such a model to include fluctuations is to assume that a random variable X(t) satisfies a stochastic differential equation (SDE), X-dot=f(X,t)+a(X,t)xi(t). In some sense, x(t) should be the average of X(t). If f is linear and a(X,t) is a constant then E(X(t))=x(t). If f(X,t) is non-linear, then E(f(X,t)) not = f(E(X),t) generally and some authors feel that the SDE is not a correct extension of the DDE. A procedure will be introduced here so that an appropriate conditional average of X(t) is x(t). Thus, there is an underlying consistency between the deterministic and stochastic formulations. The procedure also provides a prescription for the calculation of a(X,t), which is usually not constant if f(x,t) is nonlinear. Two examples are studied to illustrate the application of the procedure. First, the logistic equation of population dynamics is studied in deterministic and stochastic versions. Second, stochastic effects on a chemical oscillator are analyzed. (Author)

AD-A070 825/5GA PC **A04**/MF **A01**
Massachusetts Inst of Tech Cambridge Dept of Mathematics
Sequential Medical Trials Involving Paired Data.
Technical rept.,
Herman Chernoff, and A. John Petkau. 22 May 79, 61p Rept no. TR-14
Contract N00014-75-C-0555

Descriptors: *Sequences(Mathematics), Normal distribution, Medical research, Problem solving, Comparison, Sampling, Stopping rules(Mathematics).
Identifiers: *Medical trials, Optimal stopping, Clinical medicine, Bayesian analysis.

A continuous time version of Anscombe's formulation of the problem of comparing two treatments in the context of medical trials is considered and the Bayes sequential procedure is explicitly determined. Various suboptimal procedures are proposed, evaluated and compared to the optimal procedure; the approximation to the optimal procedure proposed by Anscombe turns out to be surprisingly efficient. Comparison with the discrete time version demonstrates that the continuous time version provides accurate approximations for clinical trials involving horizon sizes as small as 100. The optimal procedure determined here provides a design which is relevant for clinical trials involving either normal or Bernoulli responses. (Author)

AD-A070 861/0GA PC **A03**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Mathematical Theory of the Finite Element Method - Some Introductory Aspects.
Final rept. Oct 77-Dec 78,
Theodore A. Shugar. Apr 79, 43p Rept no. CEL-TN-1552

Descriptors: *Finite element analysis, Theory, Hilbert space, Boundary value problems, Convergence, Shape, Variational methods.
Identifiers: Ritz method.

The mathematical prerequisites from functional analysis that enable the understanding of the mathematical theory of finite element are organized, presented, and explained. They begin with the definition of linear vector spaces and include all intermediate definitions up to the definition of Hilbert spaces. The Ritz approximate solution method for boundary value problems is developed so that the close similarity between it and the finite element method can be observed. Solutions given by the Ritz method are projections of the true solution vector onto a subspace defined by the governing differential equations and boundary conditions. Finite element shape functions are shown to be superior to classical Ritz functions as basis vectors in the Ritz process. The finite element and Ritz methods differ primarily in the choice of continuous functions for the basis vectors. The shape functions are therefore primarily responsible for the wide acceptance and popularity of the finite element method. (Author)

AD-A070 877/6GA PC **A02**/MF **A01**
Minnesota Univ Minneapolis Dept of Electrical Engineering
F-Reduction of the Operator Riccati Equation for Hereditary Differential Systems,
M. C. Delfour, E. B. Lee, and A. Manitius. 16 Aug 77, 13p AFOSR-TR-79-0281
Grant AFOSR-72-2243
Supersedes Report dated Apr 77, AD-A039 584. Pub. in Automatica, v14 p385-395 1978.

Descriptors: *Riccati equation, Time lag theory, Linear differential equations, Hilbert space, Operators(Mathematics), Reprints.

No abstract available.

AD-A070 882/6GA PC **A02**/MF **A01**
Minnesota Univ St Paul Dept of Applied Statistics
Alternative Computational Methods for Estimation of Logit Model Parameters.
Technical rept.,
Stephen E. Fienberg, Michael M. Meyer, and G. W. Stewart. Jun 79, 7p
Contracts N00014-78-C-0600, N00014-78-C-0151

Descriptors: Statistical analysis, *Fitting functions(Mathematics), Computations, Logarithm functions, Least squares method, Iterations.
Identifiers: *Maximum likelihood estimation, Newton method, GLIM method.

In this paper we compare three different computational approaches for maximum likelihood estimation in logit situations: iterative proportional fitting, iteratively reweighted least squares as implemented in GLIM , a variant of Newton's method applied in a somewhat different form for loglinear and logit formulations.

AD-A070 905/5GA PC **A04**/MF **A01**
SRI International Menlo Park CA Computer Science Lab
A Theorem-Prover for Recursive Functions: A User's Manual.
Technical rept.,
Robert S. Boyer, and J. Strother Moore. Jun 79, 66p Rept no. SRI/CSL-91
Contract N00014-75-C-0816, Grant NSF-MCS76-81425

Descriptors: *Recursive functions, *Problem solving, *Computer programs, *Programming manuals, Theorems, Computer program verification, Computer logic, Syntax.
Identifiers: LISP programming language, Interlisp programming language.

A user's manual for an automatic theorem-proving computer program is presented. We here describe how to use the program, which is written in the INTERLISP dialect of LISP. Matters covered include our syntactic conventions; starting up the theorem-prover; defining functions; proving and storing lemmas; undoing previous work; and examining and saving the theorem-prover's state. More than 30 user commands are defined and described. Simple examples are given.

AD-A070 967/5GA PC **A02**/MF **A01**
Stanford Univ CA Information Systems Lab
System Modeling and Statistical Data Processing.
Final rept. 1 Apr 74-31 Mar 79,
Thomas Kailath. 31 Mar 79, 21p AFOSR-TR-79-0788
Contract F44620-74-C-0068

Descriptors: *Statistical processes, *Least squares method, Covariance, Random variables, Orthogonality, Riccati equation, Matrices(Mathematics), Image processing.
Identifiers: Data analysis, Statistical analysis.

Square root, least squares estimation algorithms are examined from the viewpoint that square root arrays are arrays expressing relevant problem random variables in terms of basis sets of orthonormal (identity covariance) random variables. With this viewpoint, projection-theorem arguments can be expressed directly in the square root arrays, giving simple, geometric derivations of square root algorithms. A unifying framework is provided for previously proposed square root algorithms (and square-root-free factorization algorithms), and several new square root estimation procedures are derived. Square root techniques for determining the actual error covariance of a state estimate

based on an incorrect model are extended. The ease with which either of two previously proposed techniques may be used with either the covariance or the information form of the estimator is enhanced. The two techniques are compared, and some guidance is provided as to when the use of each is advantageous. Square root error analysis is extended to the smoothing problem.

AD-A070 972/5GA PC **A04**/MF **A01**
Kentucky Univ Lexington Dept of Mathematics
Stochastic Realization and Invariant Directions of the Matrix Riccati Equation.
Interim rept.,
Michele Pavon. 1979, 62p AFOSR-TR-79-0807
Grants AFOSR-78-3519, NSF-MPS-77-00241
Prepared in part on Grant NSF-MPS-75-07028.

Descriptors: *Riccati equation, *Matrices(Mathematics), Invariance, Kalman filtering, Markov processes, Feedback, Discrete distribution, Least squares method, Difference equations.
Identifiers: Stochastic processes.

Invariant directions of the Riccati difference equation of Kalman filtering are shown to occur in a large class of prediction problems and to be related to a certain invariant subspace of the transpose of the feedback matrix. The discrete time stochastic realization problem is studied in its deterministic as well as probabilistic aspects. In particular a new derivation of the classification of the minimal markovain representations of the given process z is presented which is based on a certain backward filter of the innovations. For each markovian representation which can be determined from z, the space of invariant directions is decomposed into two subspaces, one on which it is possible to predict the state process without error forward in time and one on which this can be done backward in time. (Author)

AD-A071 032/7GA PC **A02**/MF **A01**
Computer Sciences Corp Huntsville AL
A Conditional Criterion for Identity, Leading to a Fourth Law of Logic.
Technical rept.,
Thomas E. Bearden. Jun 79, 12p

Descriptors: *Logic, Perception(Psychology), Theorems, Wave functions, Time.
Identifiers: Uncertainty principle.

By applying temporal accounting to each perceptual operation, the author shows that Aristotle's three laws are self-contradictory and incomplete, as written (i.e., they are topological, not chronotopological). A simple derivation of a fourth law is shown and an applications rule given which itself may be regarded as a fifth law of logic. The resulting four-law logic is chronotopological, and the applications rule states that either Aristotle's three laws apply explicitly and the fourth law is implicit, or the fourth law applies explicitly and Aristotle's three laws are implicit. The four-law chronotopological logic is theoretically capable of resolving every present three-law paradox.

AD-A071 060/8GA PC **A03**/MF **A01**
Rochester Univ NY Dept of Statistics
The Logit Method for Combining Tests.
Interim rept.,
E. Olusegun George, and Govind S. Mudholkar. 1979, 26p AFOSR-TR-79-0742
Grant AFOSR-77-3360

Descriptors: *Statistical tests, *Statistical distributions, Monte Carlo method, Combinatorial analysis, Computer applications.
Identifiers: Bahadur efficiency, T test, Logit method.

A new combination statistic, the sum of the logits of P-values is introduced and its standardized form is found to be essentially equivalent to a standardized Student t in null distribution. Comparisons with Fisher's omnibus procedure by Bahadur ARE, membership in a complete class of tests and a Monte Carlo simulation of the power functions, show that both procedures are equivalent by the first criterion and neither procedure is generally dominant by either of the two criteria. (Author)

AD-A071 063/2GA PC **A03**/MF **A01**
Rice Univ Houston TX Dept of Electrical Engineering
Nonlinear System Identification Based on a Fock Space Framework.
Final rept.,
L. V. Zyla, and Rui J. P. de Figueiredo. May 79, 48p Rept no. EE-TR-7901
Contract N00014-79-C-0442

Descriptors: *Operators(Mathematics), Identification, Hilbert space, Volterra equations, Complex numbers, Input output models, Approximation(Mathematics), Estimates, Numerical analysis.
Identifiers: Sobolev space, *Systems identification, Nonlinear systems, Fock space.

A method is presented for the identification of a nonlinear system represented by an operator V:E yields Y, where the input space E is a separable Hilbert space over the field of complex numbers and the output space Y is the Sobolev space H(n)-squared of complex-valued functions y on an interval I of the real line such that all the k-th derivatives of y with respect to t, k=O,...,n-1, are absolutely continuous and the n-th derivative of y with respect to t is an element of L-squared (I). The above developments permit us to obtain the solution to our nonlinear system identification problem as the solution to an appropriate minimum norm problem in B(n)-squared (I.F sub rho(E)). Procedures for obtaining both the noncausal and causal solutions are given. We also introduce the concept of 'epsilon-causality', which is weaker than that of causality, and derive an epsilon-causal solution to our problem. The case when measurement errors are present is finally considered.The results are illustrated by the computer simulation of a simple example in which very good agreement with the theory is obtained over a wide time-interval.

AD-A071 076/4GA PC **A05**/MF **A01**
Naval Postgraduate School Monterey CA
Compensator Optimization in Mulitple Input Multiple Output Control Systems.
Master's thesis,
John Tinney Mowrey. Mar 79, 80p

Descriptors: *Control systems, Optimization, Mathematical programming, Cost analysis, Computer aided design, Matrices(Mathematics), Linear systems, Theses.

The BOXPLX of a user specified cost function is evaluated as a control system design method. The emphasis is on compensator design for multiple-input-multiple-output plants, but the technique should be applicable to any control system with adjustable parameters. The engineer must define the plant dynamics, inputs and outputs, the desired output responses for the specified inputs, weighting factors for the performance measure, the type of compensation to be used, the free parameters, and initial values and constraints on the free parameters. The program gives a direct search of the optimum values, within the specified constraints, for the free parameters. Evaluation of the results is given in graphical plots of the output time responses including the desired output response as well as the compensated response.

AD-A071 093/9GA PC **A02**/MF **A01**
Delaware Univ Newark Dept of Mathematics
Remarks on the Representation of Zero by Solutions of Differential Equations,
David Colton, and Jet Wimp. 1 May 78, 4p AFOSR-TR-79-0806
Grants AFOSR-76-2879, NSF-MCS77-02056
Pub. in Proceedings of the Amerian Mathematical Society, v74 n2 p232-234 May 79.

Descriptors: *Bessel functions, Solutions(General), Power series, Convergence, Orthogonality, Reprints.
Identifiers: Differential equations.

No abstract available.

AD-A071 103/6GA PC **A03**/MF **A01**
Kentucky Univ Lexington Dept of Mathematics
A Stochastic Realization Approach to the Smoothing Problem.
Interim rept.,
Anders G. Lindquist, Faris Badawi, and Michele Pavon. 1979, 31p AFOSR-TR-79-0808
Grant AFOSR-78-3519

Descriptors: *Stochastic processes, Kalman filtering, Riccati equation, Vector analysis, Hilbert space, Covariance, Matrices(Mathematics).
Identifiers: Kalman-Bucy filters, *Data smoothing.

The purpose of this paper is to develop a theory of smoothing for finite dimensional linear stochastic systems in the context of stochastic realization theory. The basic idea is to embed the given stochastic system in a class of similar systems all having the same output process and the same Kalman-Bucy filter. This class has a lattice structure with a smallest and a largest element these two elements completely determine the smoothing estimates. This approach enables us to obtain stochastic interpretations of many important smoothing formulas and to explain the relationship between them. (Author)

AD-A071 108/5GA PC **A04**/MF **A01**
Center for Naval Analyses Alexandria VA Marine Corps Operations Analysis Group
Calculating Sample Size Requirements for Military Unit Inspections.
Research contribution,
Leo J. Grike. Mar 79, 54p Rept no. CRC-379
Contract N00014-76-C-0001

Descriptors: Sampling, *Statistical samples, *Inspection, Military requirements, Marine Corps operations, Computer programs, Computations.

Computer programs for calculating sample size requirements are presented and illustrated. Given the desired significance level and the desired probability that the sample will achieve that level, sample size requirements are calculated for determining that a unit rating: exceeds a criterion on level (with replacement), is less than a criterion level (with replacement), is between two criterion levels (with replacement), and exceeds a criterion level (without replacement). The last calcuation is done exactly (with the hypergeometric distribution) and calculated as a function of the true unit rating. (Author)

AD-A071 122/6GA PC **A02**/MF **A01**
Southern Illinois Univ Carbondale Dept of Mathematics
Approximation with Exponential Sums.
Final rept. 1 Mar 74-28 Feb 79,
David W. Kammler. 28 Feb 79, 11p AFOSR-TR-79-0759
Grant AFOSR-74-2653

Descriptors: *Exponential functions, Chebyshev approximations, Least squares method, Series(Mathematics), Biometry, Growth(General), Decay schemes.
Identifiers: *Approximation.

One major accomplishment has been the devising of a very general theory for establishing the existence of a best approximation to an arbitrary function by an exponential sum of a given order. A second result was the creation of a mathematical theory and workable numerical methods for constructing best Chebyshev, least mean, and least squares approximations for a given completely monotonic function by sums of exponentials. Finally, the compilation and publication of a bibliograph for approximation with exponential sums by the principal investigator will undoubtedly be of enormous value to others working in this area.

AD-A071 162/2GA PC **A02**/MF **A01**
Illinois Univ at Urbana-Champaign Coordinated Science Lab
A Robust Control System Design.
Interim rept.,
Juergen E. Ackermann. 1979, 9p AFOSR-TR-79-0743
Grant AFOSR-78-3633

Descriptors: *Control systems, Linear systems, Feedback, Closed loop systems, Matrices(Mathematics), Eigenvalues.
Identifiers: Robust procedures, Feedback control.

A representation of controllable linear systems is introduced, which permits assigning poles or characteristic parameters to a state feedback system by a matrix multiplication. This is used as a link between state space and classical parameter plane methods. The system representation maps a point in a nxp dimensional parameter space of characteristic parameters into the nxp dimemsional parameter space of state feedback gains, where p is the number of actuators. For p counts one the co-

ordinates of the characteristic parameter space are the coefficients of the closed loop characteristic polynomial, for p greater than one they are coefficients in a characteristic polynomial matrix and its determinant is the characteristic polynomial. By this computationally simple mapping procedure it becomes feasible to map not only a fixed set of eigenvalues but also regions in the s or z plane, in which the eigenvalues shall be located. This relaxation of the dynamic specifications permits satifying other typical design specifications like robustness with respect to sensor and actuator failures, large parameter variations, finite word length implementation, and actuator constraints. All tradeoffs between such requirements can be made in the feedback gain space. Three examples illustrate the variety of problems which can be tackled with this new tool. (Author)

AD-A071 163/0GA PC **A02**/MF **A01**
South Carolina Univ Columbia Dept of Mathematics Computer Science and Statistics
On the Nonexistence of Globally Bounded Solutions to Initial-History Value Problems for Integrodifferential Equations.
Interim rept.,
Frederick Bloom. 18 Jun 79, 20p AFOSR-TR-79-0831
Grant AFOSR-77-3396

Descriptors: Boundary value problems, Perturbations, Hilbert space, *Integral equations, Solutions(General), Theory, Dielectrics.
Identifiers: *Initial value problems.

Conditions are given under which it is impossible that there exist a solution of the integrodifferential initial-history value problem which lies in a class of bounded perturbations. An application is given to the nonexistence of globally bounded solutions, to initial-history boundary value problems for Maxwell-Hopkinson dielectrics, which lie in classes of bounded functions.

AD-A071 200/0GA PC **A02**/MF **A01**
Brown Univ Providence RI Div of Engineering
Control of Nonlinear Systems.
Interim progress rept. no. 4, 1 Oct 78-31 May 79,
Allan E. Pearson. 5 Jun 79, 7p AFOSR-TR-79-0827
Grant AFOSR-75-2793

Descriptors: *Control systems, Interception, Nonlinear systems, Feedback, Identification systems, Gain, Matrices(Mathematics), Least squares method, *Control theory.

Progress is described on a method for stabilizing linear differential systems by state variable feedback in which the gain matrix stems from the finite pure integration of the controllability Gramian and the resulting system tolerates a large class of nonlinearities in the loop without destroying stability. Research results are summarized for the thoeretical investigation of minimum energy controls for a class of commutative bilinear systems which relate to a two-dimensional intercept control problem. Progress and research results are also described for a new equation error formulation for the least squares parameter estimation problem for nonlinear system identification and signal reconstruction. (Author)

AD-A071 201/8GA PC **A02**/MF **A01**
Southern Methodist Univ Dallas TX Dept of Statistics
A Relationship between Generalized and Integrated Mean Squared Errors.
Interim rept.,
R. F. Gunst, and J. L. Hess. 1979, 9p AFOSR-TR-79-0811
Grant AFOSR-75-2871
Prepared in cooperation with Kansas State Univ., Manhattan.

Descriptors: *Linear regression analyses, *Error analysis, Bias, Estimates, Weighting functions.

Generalized mean squared error is a flexible measure of the adequacy of a regression estimator. It allows specific characteristics of the regression model and its intended use to be incorporated in the measure itself. Similarly, integrated mean squared error enables a researcher to stipulate particular regions of interest and weighting functions in the assessment of a prediction equation. The appeal of both measures is their ability to allow design or model characteristics to directly influence the evaluation of fitted regression models. In this note an equivalence of the two measures is established for correctly specified models. (Author)

N79-28614/2GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A Method for Obtaining Practical Flutter-Suppression Control Laws Using Results of Optimal Control Theory.
J. R. Newson. Aug 79, 34p NASA-TP-1471, L-12728

Descriptors: Aeroelasticity, Control theory, Flutter, *Optimal control, *Vibration damping, Dynamic response, Feedback control, Frequency ranges, Nonlinear programming, Transfer functions, Wind tunnel models.
Identifiers: *Feedback control.

For abstract, see STAR 1719

PB-298 628/9GA PC **A03**/MF **A01**
Economics, Statistics, and Cooperatives Service, Washington, DC. Statistical Research Div.
Error Profile for Multiple-Frame Surveys.
Final rept.,
Norman D. Beller. Aug 79, 29p ESCS-63

Descriptors: *Sampling theory, *Error analysis, Errors, Population(Statistics), Agriculture, Estimates.

Multiple-frame surveys are susceptible to errors that stem from associating the overlapping portions of the frames. Decreasing sampling error may improve precision, but it offers greater complications; nonsampling error would increase, leading to decreased accuracy and, perhaps, greater total error. This manuscript offers several procedures to improve consistency and accuracy of multiple-frame estimating by reducing nonsampling errors. Such procedures, when added to an optimum mix of sampling frames, would provide survey indications of greater reliability without increasing costs appreciably.

PB-298 632/1GA PC **A02**/MF **A01**
Office of Personnel Management, Washington, DC. Personnel Research and Development Center.
An Application of Chebyshev's Theorem to the Analysis of Population Data.
Technical note (Final),
Stephen M. Cormier. Apr 79, 9p TN-79/1

Descriptors: *Population(Statistics), Statistical analysis, Estimating, Theorems.
Identifiers: Chebyshev theorem.

An application of Chebyshev's theorem is described which enables the estimation of the distance between two populations. This method is intended for use in situations where inferential statistical methods are not practical, such as the analysis of total population data, where normality cannot be assumed. The method is applied to two types of situations involving the determination of population differences, and a concrete example is provided.

12B. Operations Research

AD-A071 042/6GA PC **A03**/MF **A01**
Cornell Univ Ithaca NY Dept of Operations Research
An Analysis of a Single Location Inventory Problem for Two Interchangeable Recoverable Items.
Interim rept.,
John A. Muckstadt. 1 Apr 79, 41p AFOSR-TR-79-0744
Grant AFOSR-78-3568

Descriptors: *Inventory control, Decision making, Decision theory, Markov processes, Policies, Optimization.
Identifiers: Poisson processes, Failure.

We studied the interchangeability/substitutability problem for two recoverable items that fail at a single location. We assumed the failure processes for each type of item are independent, stationary Poisson processes and that the repair times are exponentially distributed. Furthermore, we assumed that the system is a closed system, that is , no items are added to or deleted from the system. We first considered a discrete-time problem and showed that this problem is a Markovian decision problem. We then showed that for this problem there exist optimal stationary Markov control policies. Next we formulated a continuous time model and showed how to find the optimal stationary Markov control policy using linear programming. Unfortunately, this approach was shown to be impractical for solving most real problems. Consequently, we established and explored some of the properties that we feel an optimal policy should possess. We developed heuristic procedures that can be used to find a good policy for managing this class of items.

SAND-78-1846 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Model for Distributed Service Systems.
D. R. Strip. Apr 79, 30p
Contract EY-76-C-04-0789

Descriptors: Computer networks, Economics, Mathematical models.
Identifiers: ERDA/990200, *Network flows, Distribtuion(Property), Optimization.

For abstract, see ERA citation 04:045767.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AED-CONF-78-155-060 PC **A02**/MF **A01**
Kraftwerk Union A.G., Muelheim an der Ruhr (Germany, F.R.).
District Heat from Large Power Plants.
A. Bald, and J. Charlier. 1978, 6p CONF-7804102-35
In German.Systems exhibition energy within the context of the Hannover fair, Hannover, F.R. Germany, 19 Apr 1978.
U.S. Sales Only.

Descriptors: *District heating, *Nuclear power plants, *Thermal power plants, Co-generation, Dual-purpose power plants, Power generation, Steam generation, Waste heat, Waste heat utilization.
Identifiers: ERDA/200105, ERDA/210100, ERDA/290800, West Germany.

No abstract available.

ANL/ICES-TM-27 PC **A06**/MF **A01**
Rocket Research Corp., Redmond, WA.
Heat Pump Centered Integrated Community Energy Systems: System Development. Rocket Research Company Interim Report.
Feb 79, 105p
Contract W-31-109-ENG-38

Descriptors: *Communities, *Heat pumps, *ICES, District cooling, District heating, Economics, Energy conservation, Environmental effects, Feasibility studies, Graphs, Heat recovery, Heat storage, Municipal wastes, Performance, Research programs, Tables, Theoretical data, Waste heat, Waste water.
Identifiers: ERDA/320600, ERDA/290800.

For abstract, see ERA citation 04:043340.

ANL/ICES-TM-29 PC **A11**/MF **A01**
Dubin-Bloome Associates, New York.
Heat Pump Centered Integrated Community Energy Systems: Systems Development. Dubin--Bloome Associates Interim Report.
F. S. Dubin, A. Halfon, and P. Herzog. Feb 79, 242p
Contract W-31-109-ENG-38

Descriptors: *Communities, *District cooling, *District heating, *Heat pumps, *ICES, Economics, Energy conservation, Energy demand, Environ-

mental effects, Feasibility studies, Graphs, Performance, Tables, Theoretical data.
Identifiers: ERDA/320600, ERDA/290800.

For abstract, see ERA citation 04:043342.

ANL/ICES-TM-31 PC **A08**/MF **A01**
Honeywell, Inc., Minneapolis, MN. Energy Resources Center.
Heat Pump Centered Integrated Community Energy System: System Development. Honeywell Energy Resources Center Interim Report.
Mar 79, 153p
Contract W-31-109-ENG-38

Descriptors: *Communities, *Heat pumps, *ICES, Buildings, District cooling, District heating, Economics, Energy conservation, Feasibility studies, Heat recovery, Municipal wastes, Performance, Research programs, Space heating, Tables, Theoretical data, Waste heat, Waste water.
Identifiers: ERDA/320600, ERDA/290800.

For abstract, see ERA citation 04:043343.

ANL/MHD-79-7 PC **A05**/MF **A01**
Argonne National Lab., IL.
Analytical Studies of NO/sub X/ Decomposition in the Radiant Boiler of an Open-Cycle MHD Power Plant.
A. J. Sistino. Apr 79, 88p
Contract W-31-109-ENG-38

Descriptors: *Boilers, *Coal-fired mhd generators, *Mhd power plants, *Nitrogen oxides, Air pollution abatement, Analytical solution, Chemical composition, Chemical reaction kinetics, Combustion products, Computer calculations, Decomposition, Flue gas, Fluid flow, Geometry, Heat transfer, Mathematical models, Open-cycle mhd generators, Optimization, Stoichiometry, Temperature dependence.
Identifiers: ERDA/300101, ERDA/424000, Electric power plants.

For abstract, see ERA citation 04:044935.

BNL-25928 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Experimental Performance Study of a Series Solar Heat Pump.
E. A. Kush. 1979, 6p CONF-790446-2
Contract EY-76-C-02-0016
Annual heat pump technology conference, Stillwater, OK, USA, 9 Apr 1979.

Descriptors: *Solar-assisted heat pumps, Coefficient of performance, Compressors, Heat exchangers, Heat pumps, Performance, Simulators, Valves.
Identifiers: ERDA/140901.

For abstract, see ERA citation 04:040550.

BNL-50998 PC **A07**/MF **A01**
Brookhaven National Lab., Upton, NY.
Abstracts of Reports Published in Energy Technology Programs of the Department of Energy and Environment. Progress Report, January–December 1978.
1978, 130p
Contract EY-76-C-02-0016

Descriptors: BNL, Energy, *Energy conservation, Air conditioning, *Bibliographies, Chemical reactions, Combustion, Energy conversion, Energy storage, Environment, Environmental impacts, Fossil fuels, Fuel cells, Management, Solar cooling systems, *Solar energy, Solar-assisted heat pumps, Space heating.
Identifiers: ERDA/320000, ERDA/140900, ERDA/250000, ERDA/300500, ERDA/530000.

For abstract, see ERA citation 04:044962.

CONF-7805162-P1 PC **A10**/MF **A01**
Florida Solar Energy Center, Cape Canaveral.
Proceedings of the Solar Energy Consumer Protection Workshop: Opening and Final Plenary Sessions. Volume I.
Mar 79, 209p
Solar Energy Consumer Energy workshop, Atlanta, GA, USA, 3 May 1978.

Descriptors: *Residential sector, Solar air conditioning, Solar heating, *Solar industry, Building codes, Competition, Consumer protection, Education, Evaluation, Implementation, Licensing, Market, *Meetings, Reviews.
Identifiers: ERDA/140000, ERDA/299001, ERDA/320101, *Solar heating systems, *Solar cooling systems, Marketing.

For abstract, see ERA citation 04:040505.

CONF-790401-1 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Description of District Heating: History and Current Status.
M. A. Karnitz, M. Olszewski, T. D. Anderson, and A. M. Rubin. 1979, 17p
Contract W-7405-ENG-26
District heating coal generation symposium, Minneapolis, MN, USA, 2 Apr 1979.

Descriptors: *Co-generation, *District heating, Boilers, Coal, Competition, Economics, Energy efficiency, Europe, Evaluation, Fuel substitution, Hot water, Implementation, Minnesota, Nuclear fuels, Space heating, USA, Viability, Water heaters.
Identifiers: ERDA/290800.

For abstract, see ERA citation 04:041045.

COO-2854-1 PC **A04**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Mechanical Engineering.
Development and Evaluation of Thermic Diode Solar Panels for Building Heating and Cooling. Final Report: November 1, 1975–October 31, 1977.
S. Buckley. Jul 78, 71p
Contract EY-76-S-02-2854

Descriptors: *Solar collectors, *Thermic diode solar panels, Cost, Fabrication, Heat exchangers, Heat storage, Heat transfer, Investment, Marketing research, Mathematical models, Passive solar heating systems, Payback period, Solar space heating, Solar water heating, Thermosyphon effect.
Identifiers: ERDA/141000, ERDA/140901.

For abstract, see ERA citation 04:044626.

COO-4704-2 PC **A02**/MF **A01**
Zia Associates, Inc., Boulder, CO.
Heat Pump/Rock Bed Storage Systems.
G. L. Mills, and H. E. Remmers. 1979, 9p CONF-790328-3
Contract EM-78-C-02-4704
Solar energy storage options workshop, San Antonio, TX, USA, 18 Mar 1979.

Descriptors: *Heat pumps, *Rock beds, *Sensible heat storage, Cooling load, Cost, Economic analysis, Heat losses, Heating load, Houses, New Mexico, Solar heating systems, T codes, Wisconsin.
Identifiers: ERDA/140901, Heat storage.

For abstract, see ERA citation 04:040552.

DOE/CS-0083 PC **A12**/MF **A01**
Department of Energy, Washington, DC. Office of Conservation and Solar Applications.
Workshop Manual on Technical, Economic and Legal Considerations for Evaluating Solar Heated Buildings for Lenders, Appraisers, Insurers, and Tax Consultants.
Mar 79, 253p

Descriptors: *Solar space heating, *Solar water heating, Building codes, Energy demand, Energy supplies, Financial incentives, Financing, Hazards, Insurance, Legal aspects, Life-cycle cost, Maintenance, *Manuals, Operation, Passive solar heating systems, Solar air heaters.
Identifiers: ERDA/140901, ERDA/140400, ERDA/140300, ERDA/299001, Constraints.

For abstract, see ERA citation 04:042673.

FE-1726-20A PC **A06**/MF **A01**
Curtiss-Wright Corp., Wood-Ridge, NJ. Power Systems Div.
Engineer, Design, Construct, Test and Evaluate a Pressurized Fluidized Bed Pilot Plant Using High Sulfur Coal for Production of Electric Power. Phase I: Preliminary Engineering, Commercial Plant Conceptual Design.
15 Mar 77, 109p CW-WR-76-015-20A
Contract EX-76-C-01-1726

Descriptors: *Combined-cycle power plants, *Fluidized-bed combustors, Capital, Coal, Design, Dolomite, Economics, Engineering, Flowsheets, Gas turbines, Graphs, Medium pressure, Numerical data, Tables, Thermal efficiency, Waste heat utilization.
Identifiers: ERDA/014000, ERDA/200100, ERDA/421000, Electric power plants, *Air pollution control, Industrial wastes, Combustion products, Performance evaluation.

For abstract, see ERA citation 04:044270.

FE-2361-19 PC **A03**/MF **A01**
Hydrocarbon Research, Inc., Lawrenceville, NJ.
Development of a Fast Fluid Bed Gasifier. Phase I, Task II. Quarterly Progress Report, July–September 1977.
B. Molayem, and M. Koziel. Oct 77, 39p
Contract EX-76-C-01-2361

Descriptors: *Coal gasification plants, Design, Fluidized bed, Low btu gas.
Identifiers: ERDA/010404, *Fluidized bed processors.

For abstract, see ERA citation 04:044212.

HCP/M4113-03 PC **A10**/MF **A01**
AIA Research Corp., Washington, DC.
Passive Solar Design: An Extensive Bibliography.
Dec 78, 218p
Contract EG-77-C-01-4113

Descriptors: *Passive solar cooling systems, *Passive solar heating systems, Agriculture, *Bibliographies, Design, Economics, Evaporative cooling, Glazing materials, Greenhouses, Heat gain, Heat storage, Hybrid systems, Insolation, Radiative cooling, Reflectivity, Shading, Solar ponds, Thermal insulation, Thermosyphon effect, Ventilation.
Identifiers: ERDA/140901, ERDA/299001, Solar heating systems.

For abstract, see ERA citation 04:042677.

HCP/T1237-01/13 PC **A05**/MF **A01**
Pope, Evans and Robbins, Inc., New York.
Multicell Fluidized Bed Boiler Design Construction and Test Program. Quarterly Progress Status Report, July–September 1978.
May 79, 100p
Contract EX-76-C-01-1237

Descriptors: *Boilers, Coal, *Fossil-fuel power plants, Air pollution control, Design, Experimental data, Fluidized bed, Fluidized-bed combustion, Fly ash, Graphs, Particle size, Performance, Performance testing, Research programs, Tables.
Identifiers: ERDA/200104, Electric power plants, High sulfur coal.

For abstract, see ERA citation 04:042837.

LA-UR-78-427 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Passive Solar Heating for Buildings.
J. D. Balcomb. 1979, 16p CONF-790224-1
Contract W-7405-ENG-36
Workshop on passive solar design, Perth, Australia, 23 Feb 1979.

Descriptors: *Passive solar heating systems, Buildings, Design, Greenhouses, Natural convection, Performance, Simulation.
Identifiers: ERDA/140901, Solar heating systems.

For abstract, see ERA citation 04:040553.

LBL-7811 PC **A15**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Some Analytic Models of Passive Solar Building Performance: A Theoretical Approach to the Design of Energy-Conserving Buildings.
D. B. Goldstein. Nov 78, 347p
Contract W-7405-ENG-48

Descriptors: *Buildings, *Houses, *Passive solar heating systems, Analytical solution, Energy conservation, Mathematical models, Thermal efficiency.
Identifiers: ERDA/140901, ERDA/320100.

For abstract, see ERA citation 04:038470.

MLM-2606(OP) PC **A02**/MF **A01**
Mound Facility, Miamisburg, OH.
Evaluation of a Large Nonconvective Solar Pond.
L. J. Wittenberg, and M. J. Harris. 1979, 12p
CONF-790328-2
Contract EY-76-C-04-0053
Solar energy storage options workshop, San Antonio, TX, USA, 18 Mar 1979.

Descriptors: *Solar ponds, Data acquisition, Depth, Heat losses, Ohio, Performance, Salinity gradients, Sensible heat storage, Temperature distribution, Temperature gradients.
Identifiers: ERDA/141000, ERDA/142000, ERDA/250600.

For abstract, see ERA citation 04:038492.

NBSIR-79-1731 PC **A04**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Center for Fire Research.
Review of Fire Incidents, Model Building Codes, and Standards Related to Wood-Burning Appliances.
R. D. Peacock. May 79, 58p
Contract EA-77-A-01-6010-047

Descriptors: *Wood burning furnaces, Accidents, Building codes, Chimneys, Construction, Fire hazards, Injuries, Installation, Performance testing, Reviews, Safety, Standards.
Identifiers: ERDA/320100, ERDA/420600.

For abstract, see ERA citation 04:043265.

N79-28470/9GA PC **A04**/MF **A01**
Grumman Aerospace Corp., Bethpage, NY.
Cryogenic Thermal Diode Heat Pipes.
Final Report.
J. Alario. Feb 79, 59p NASA-CR-152268
Contract NAS2-7492

Descriptors: Cryogenic equipment, Dynamic characteristics, *Heat pipes, *Thermionic diodes, Computer programs, Ethane, Graphs (Charts), Orifices, Space flight, Stainless steels, Systems engineering, Tables (Data), Wetting.
Identifiers: Cryogenics, Working fluids.

For abstract, see STAR 1719

ORO-5552-4(V.1) PC **A10**/MF **A01**
Auburn Univ., AL. Dept. of Mechanical Engineering.
Improving the Efficiency, Safety, and Utility of Woodburning Units. Quarterly Report No. WB-4, June 15--September 15, 1978. Volume 1.
D. F. Dyer, T. T. Maxwell, and G. Maples. 15 Sep 78, 201p
Contract EC-77-S-05-5552

Descriptors: *Stoves, Wood, *Wood burning furnaces, Combustion, Efficiency, Energy conservation, Experimental data, Graphs, Mathematical models, Performance, Performance testing, Research programs, Safety, Space heating, Tables, Theoretical data.
Identifiers: ERDA/421000.

For abstract, see ERA citation 04:041471.

PB-297 582/9GA PC **A04**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Center for Building Technology.
Residential Solar Data Center Data Resources and Reports,
Patricia M. Christopher, and Joan E. Krzewick. Jun 79, 69p NBSIR-79-1762
Sponsored in part by Department of Housing and Urban Development, Washington, DC. Div. of Energy, Building Technology and Standards.

Descriptors: *Solar energy, *Data acquisition, *Information systems, Residential buildings, Information retrieval, Data processing.
Identifiers: *Residential Solar Data Center, National Bureau of Standards, Solar heating systems, Solar cooling systems, Solar water heating, Data bases.

The Residential Solar Data Center (SDC) is responsible for the establishment and operation of a computerized data base containing non-instrumented residential data collected from the DOE/HUD Solar Heating and Cooling Demonstration Program. This document includes a summary of the history and background of the SDC and its role in the Demonstration Program, a list of the computer reports which are available and sample pages of representative reports, a description of the data files which comprise the solar data base, a description of the interactive access to the solar data base, a set of figures showing the amount of data on the computer, and a list of other Solar Data Center publications.

PB-298 494/6GA PC **A09**/MF **A01**
TRW, Inc., Redondo Beach, CA.
Emissions Assessment of Conventional Stationary Combustion Systems. Volume I. Gas- and Oil-fired Residential Heating Sources.
Final rept. Sep 76-Mar 79,
N. F. Surprenant, R. R. Hall, K. T. McGregor, and A. S. Werner. May 79, 177p EPA/600/7-79/029B
Contract EPA-68-02-2197
See also Volume 2, PB-296 390. Also pub. as GCA Corp., Bedford, MA. GCA Technology Div. rept. no. GCA-TR-77-30-G(1).

Descriptors: *Air pollution, *Oil burners, *Gas heaters, Nitrogen oxides, Sulfur dioxide, Sulfur trioxide, Organic compounds, Polycyclic compounds, Nickel, Residential buildings, Heating, Houses, Measurement.

Emissions from gas- and oil-fired residential heating sources were assessed through a critical examination of existing emissions data, followed by the conduct of a phased measurement program to fill gaps in the emissions data base. Initially, five gas-fired and five oil-fired residential sources were selected for testing. Mass emission rates of criteria pollutants, trace elements, and organics, including polycyclic organic matter (POM), were determined. Subsequent evaluation of the test program led to a decision to conduct additional tests at one gas-fired and two oil-fired sites. The principal objective of this second test program was to determine the effect of burner on/off cycle on emissions. Particulate sulfate, SO2, and SO3 emission data were also obtained at the oil-fired sites. The results of the emissions assessment indicate that residential sources are of potential significance based on multiple source severity factors calculated for an array of houses burning gas or oil. Pollutants for which multiple source severity factors exceed 0.05, the level which may be potentially significant, are NOx from gas-fired sources and SO3, NOx, and Ni from oil-fired sources.

PB-299 058/8GA PC **A03**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Building Thermal and Service Systems Div.
Field Performance of Residential Refrigerators and Combination Refrigerator-Freezers,
Yui-May L. Chang, and Richard A. Grot. Jul 79, 46p NBSIR-79-1781

Descriptors: *Electric refrigerators, *Freezers, Residential buildings, Utilization, Electric power demand, Evaluation.
Identifiers: Energy consumption.

Evaluation of the performance of household refrigerators and combination refrigerator-freezers was undertaken in a field experiment to determine the effect of room environment and occupant-usage habits on energy consumption of these appliances. This report presents the results of such an experiment in ten townhouses at Twin Rivers, NJ. One-door manual defrost and two-door frost-free models of various sizes were studied. Energy consumption, kitchen temperature, refrigerator temperature and door openings were measured for each model by data acquisition systems located in the townhouse basements. Both daily and hourly averages and variations about the average for each variable were calculated to determine occupant-usage patterns. Statistical techniques were used to obtain the effect of parameters on energy consumption of these appliances by linear regression of both one- and two-parameter models.

SAN-1590-1/3 PC **A06**/MF **A01**
Carrier Corp., Syracuse, NY. Energy Systems Div.
Development of a High Temperature Solar Powered Water Chiller. Volume 3. Phase I Technical Progress Report, September 26, 1977--June 1, 1978.
R. A. English. Jun 78, 121p
Contract EG-77-C-03-1590

Descriptors: *Solar air conditioners, Absorption refrigeration cycle, Design, Freons, Heat exchangers, Performance, Research programs.
Identifiers: ERDA/140901, Air conditioners.

For abstract, see ERA citation 04:042680.

13B. Civil Engineering

AD-A070 573/1GA PC **A08**/MF **A01**
Northern Research and Engineering Corp Cambridge MA
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume 1. Program Description and Results.
Interim rept. Aug 74-Jun 77,
Melvin Platt, and E. R. Norster. May 78, 155p NREC-1238-6, FAA-RD-78-56-1, FAA-NA-77-179-VOL-1
Contract DOT-FA74NA-1100
See also Volume 2, AD-A070 574. Prepared in cooperation with United Air Lines, Inc., Trans World Airlines and Federal Express Administration.

Descriptors: *Exhaust gases, Gas turbines, Turbofan engines, *Air quality, Time, Degradation, Emission, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Smoke, Monitoring, Air pollution, Standards, Pollution abatement.
Identifiers: JT-8D-9 Turbofan engine, JT-8D-7 Turbofan engine, JT-3D-7 Turbofan engine, JT-3D-3B Turbofan engine, JT-9D-3A Turbofan engine, RB-211-22B Turbofan engine, CF-700-2D Turbofan engine, Time Degradation factors, Monitoring.

This is the first volume of an eight-volume interim report which documents the test data obtained in a study of turbine emission degradation. This volume contains an introduction to the program, a description of the test schedule, equipment, procedures, and data processing techniques, as well as a discussion of the test data itself. A total of 519 repetitious emission tests were conducted over a period of 22 months on units of the following engine types: JT8D-9, JT8D-7, JT3D-7, JT3D-3B, JT9D-3A, RB211-22B, and CF700-2D. Emissions of CO2, CO, HC, NO, NOx, and smoke were monitored, in addition to various engine operating parameters, over an eight-mode test cycle ranging from cold idle to take-off and back to hot idle. (Author)

AD-A070 574/9GA PC **A17**/MF **A01**
Northern Research and Engineering Corp Cambridge MA
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume II. JT8D-9 Test Data.
Interim rept. Aug 74-Jun 77.
May 78, 383p NREC-1238-7, FAA-RD-78-56-2, FAA-NA-77-179-Vol-2
Contract DOT-FA74NA-1100
See also Volume 3, AD-A070 575. Prepared in cooperation with Trans World Airlines, Kansas City, MO.

Descriptors: *Exhaust gases, Gas turbines, Turbofan engines, *Air quality, Tables(Data), Time, Degradation, Emission, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Test methods, Air pollution, Standards.
Identifiers: JT-8D-9 turbofan engines, Time degradation factors.

This is the second volume of an eight-volume report concerning the degradation of turbine engine emissions. This volume contains a compilation of all emission test data and analysis data used in the development of degradation factors for the JT8D-9 engine type. In addition, the volume contains maintenance data for the test units during the period of testing, as well as analyses of the samples of fuel used in each test. (Author)

AD-A070 575/6GA PC **A17**/MF **A01**
Northern Research and Engineering Corp Cambridge Mass
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume III. JT8D-7 Test Data.
Interim rept. Aug 74-Jun 77.
May 78, 377p NREC-1238-8, FAA-RD-78-56-3, FAA-NA-77-179-VOL-3

Contract DOT-FA74NA-1100
See also Volume 4, AD-A070 576. Prepared in cooperation with United Air Lines, San Francisco, CA.

Descriptors: *Exhaust gases, *Gas turbines, *Turbofan engines, *Air quality, Tables(Data), Time, Degradation, Emission, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Test methods, Air pollution, Standards, Pollution abatement.
Identifiers: JT-8D-7 turbofan engines, Time degradation factors.

This is the third volume of an eight-volume report concerning the degradation of turbine engine emissions. This volume contains a compilation of all emission test data and analysis data used in the development of degradation factors for the JT8D-7 engine type. In addition, the volume contains maintenance data for the test units during the period of testing, as well as analyses of the samples of fuel used in each test. (Author)

AD-A070 576/4GA PC **A16**/MF **A01**
Northern Research and Engineering Corp Cambridge MA
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume IV. JT3D-7 Test Data.
Interim rept. Aug 74-Jun 77.
May 78, 374p NREC-1238-9, FAA-RD-78-56-4, FAA-NA-77-179-VOL-4
Contract DOT-FA74NA-1100
See also Volume 5, AD-A070 577. Prepared in cooperation with United Air Lines, Inc., San Francisco, CA.

Descriptors: *Exhaust gases, Gas turbines, Turbofan engines, *Air quality, Tables(Data), Time, Degradation, Emission, Air pollution, Standards, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Test methods.
Identifiers: JT-3D-7 turbofan engines.

This is the fourth volume of an eight-volume report concerning the degradation of turbine engine emissions. This volume contains a compilation of all emission test data and analysis data used in the development of degradation factors for the JT3D-7 engine type. In addition, the volume contains maintenance data for the test units during the period of testing, as well as analyses of the samples of fuel used in each test. (Author)

AD-A070 577/2GA PC **A04**/MF **A01**
Northern Research and Engineering Corp Cambridge MA
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume V. JT3D-3B Test Data.
Interim rept. Aug 74-Jun 77.
May 78, 75p NREC-1238-10, FAA-RD-78-56-5, FAA-NA-77-179-Vol-5
Contract DOT-FA74NA-1100
See also Volume 6, AD-A070 578. Prepared in cooperation with United Air Lines, Inc., San Francisco, CA.

Descriptors: *Exhaust gases, Gas turbines, Turbofan engines, *Air quality, Tables(Data), Time, Degradation, Emission, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Test methods, Air pollution, Standards.
Identifiers: JT-3D-3B turbofan engines, Time degradation factors.

This is the fifth volume of eight-volume report concerning the degradation of turbine engine emissions. This volume contains a compilation of all emission test data and analysis data used in the development of degradation factors for the JT3D-3B engine type. In addition, the volume contains maintenanec data for the test units during the period of testing, as well as analyses of the samples of fuel used in each test.

AD-A070 578/0GA PC **A17**/MF **A01**
Northern Research and Engineering Corp Cambridge MA
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume VI. JT9D-3A Test Data.
Interim rept. Aug 74-Jun 77.
May 78, 377p NREC-1238-11, FAA-RD-78-56-6, FAA-NA-77-179-Vol-6
Contract DOT-FA74NA-1100
See also Volume 1, AD-A070 573. Prepared in cooperation with United Air Lines, Inc., San Francisco, CA.

Descriptors: *Exhaust gases, Gas turbines, Turbofan engines, *Air quality, Tables(Data), Degradation, Emission, Air pollution, Standards, Carbon dioxide, Carbon monoxide, Hydrocarbons, Nitrogen oxides.
Identifiers: JT-9D-3A turbofan engines.

This is the sixth volume of an eighth-volume report concerning the degradation of turbine engine emissions. This volume contains a compilation of all emission test data and analysis data used in the development of degradation factors for the JT9D-3A engine type. In addition the volume contains maintenance data for the test units during the period of testing, as well as analyses of the samples of fuel used in each test. (Author)

AD-A070 579/8GA PC **A14**/MF **A01**
Northern Research and Engineering Corp Cambridge MA
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume VII. RB211-22B Test Data.
Interim rept. Aug 74-Jun 77.
May 78, 319p NREC-1238-12, FAA-RD-78-56-7, FAA-NA-77-179-VOL-7
Contract DOT-FA74NA-1100
See also Volume 8, AD-A070 580.

Descriptors: *Exhaust gases, Gas turbines, Turbofan engines, *Air quality, Emission, Jet engine fuels, Air pollution, Pollution abatement, Aircraft, Tables(Data), Time, Degradation, Carbon dioxide, Carbon monoxide, Hydrocarbons, Test methods.
Identifiers: Time degradation factors, RB-211-22B turbofan engines.

This is the seventh volume of an eight-volume report concerning the degradation of turbine engine emissions. This volume contains a compilation of all emission test data and analysis data used in the development of degradation factors for the RB-211-22B engine type. In addition, the volume contains maintenance data for the test units during the period of testing, as well as analyses of the samples of fuel used in each test. (Author)

AD-A070 580/6GA PC **A12**/MF **A01**
Northern Research and Engineering Corp Cambridge MA
Time Degradation Factors for Turbine Engine Exhaust Emissions. Volume VIII. CF700-2D Test Data.
Interim rept. Aug 74-Jun 77.
May 78, 263p NREC-1238-13, FAA-RD-78-56-8, FAA-NA-77-179-VOL-8
Contract DOT-FA74NA-1100
See also Volume 1, AD-A070 573.

Descriptors: *Exhaust gases, *Gas turbines, Turbofan engines, *Air quality, Emission, Jet engine fuels, Air pollution, Pollution abatement, Aircraft, Tables(Data), Time, Degradation, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Test methods.
Identifiers: Time degradation factors, CF-700-2D turbofan engines.

This is the last volume of an eight-volume report concerning the degradation of turbine engine emissions. This volume contains a compilation of all emission test data and analysis data used in the development of degradation factors for the CF700-2D engine type. In addition, the volume contains maintenance data for the test units during the period of testing, as well as analyses of the samples of fuel used in each test. (Author)

AD-A070 584/8GA PC **A06**/MF **A01**
GAI Consultants Inc Monroeville PA
National Dam Inspection Program. Upper Donohoe Dam (now Referred to as) Twin Lakes Number 2 Dam, NDS I.D. PA-00478, PennDER I.D. 65-55), Ohio River Basin, Little Cragtree Creek, Westmoreland County, Pennsylvania. Phase I Inspection Report.
Apr 79, 109p
Contract DACW31-79-C-0013
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Recreation, Reservoirs, Embankments, Geology.
Identifiers: National dam inspection program, *Upper Donohoe Dam, Spillways, *Twin Lakes Number 2 Dam.

The Upper Donohoe Dam is an earth embankment approximately 520 feet in length with a maximum height of 34 feet. According to PennDER records, the embankment was constructed with a puddle cutoff wall having a top and base width of 10 feet, a maximum height of approximately 18 feet and length of 500 feet. The depth of excavation for the cutoff wall is reportedly about 15 feet below the original ground surface. Both the upstream and downstream slopes were originally protected by 'stone covered with mortar.' Recently, however, a hard, siliceous limestone riprap was placed on the top 5 to 6 feet of the upstream slope and a brick deck was laid across the entire crest. The facility is served by a rectangular-shaped concrete channel spillway constructed in 1977 and located at the right abutment. The discharge channel is cut in natural ground and rock below the spillway. A 12-inch diameter cast iron pipe passes beneath the center of the embankment and serves as the outlet conduit. The outlet conduit is valved at a valve house located at the downstream toe of the embankment. Upper Donohoe Dam is located on the headwaters of Little Crabtree Creek in Hempfield and Unity Townships, Westmoreland County, Pennsylvania.

AD-A070 585/5GA MF **A01**
GAI Consultants Inc Monroeville PA
National Dam Inspection Program. Twin Lakes Number 1 Dam (NDS I.D. PA-00487, PennDER I.D. 65-42), Ohio River Basin, Little Crabtree Creek, Westmoreland County, Pennsylvania. Phase I Inspection Report.
Apr 79, 109p
Contract DACW31-79-C-0013
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Recreation, Reservoirs, Repair, Maintenance, Geology.
Identifiers: National Dam Inspection Program, *Twin Lakes Number 1 Dam, Spillways, *Lower Donohoe Dam.

Twin Lakes No. 1 Dam, previously known as the Lower Donohoe Dam, is a recently renovated (1975) earth embankment approximately 950 feet long with a curved crest and a maximum height of about 31 feet. The facility is serviced by an uncontrolled, concrete chute spillways, 80 feet wide at the crest and 25 feet wide at the toe, located at the center of the embankment. The facility is equipped with newly constructed outlet works consisting of a 16-inch diameter ductile valve, and outlet discharge pipe. The control valve is operated from a manhole accessible from the embankment crest just left of the spillway. An extension on the control valve permits operation without actually descending the manhole. The dam is located in Hempfield and Unity Townships, Westmoreland County, on Little Crabtree Creek, approximately three miles northwest of the city of Greensburg, Pennsylvania.

AD-A070 586/3GA PC **A04**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. Brady's Run Dam. (NDI I.D.-PA-257, DERID-4-35), Ohio River Basin, South Fork of Brady's Run, Beaver County, Pennsylvania. Phase I Inspection Report.
May 79, 68p
Contract DACW31-79-C-0014
riginal contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Reservoirs, Recreation, Geology, Maintenance.
Identifiers: National Dam Inspection Program, *Brady's Run Dam, Spillways.

Brady's Run Dam consists of an earth embankment approximately 350 feet long with a maximum height of 33 feet from the downstream toe and a crest width of 12 feet. The flood discharge facilities for the dam consist of a combined primary and emergency spillway located near the left abutment

(looking downstream). The spillway structures of the dam consist of a concrete overflow section, and a rectangular concrete spillway chute which terminates in a concrete-lined plunge pool at the toe level of the dam near the left abutment. The overflow structure of the spillway is a 135-foot-long ogee weir located at an elevation approximately 10 feet below the dam crest. The outlet works consist of a reinforced concrete box culvert and a control tower located near the right abutment. Flow through the outlet conduit is controlled by a manually operated sluice gate located at the control tower. The outlet conduit constitutes the emergency drawdown facilities for the reservoir. The dam is located on the South Branch of Brady's Run approximately one mile upstream from its confluence with the North Branch in Brighton Township, Beaver County, Pennsylvannia.

AD-A070 600/2GA MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Salt Run Reservoir Dam (NDI Number PA-00392, PennDER Number 12-4), Susquehanna River Basin, Salt Run, Cameron County, Pennsylvania. Phase I Inspection Report.
Feb 79, 85p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Seepage, Reservoirs, Water supplies, Maintenance, Geology.
Identifiers: National Dam Inspection Program, *Salt Run Reservoir Dam, Spillways.

Salt Run Reservoir Dam consists of a diaphragm earthfill embankment approximately 42 feet high and 355 feet long. The uncontrolled overflow spillway is located at the right abutment of the dam and is 65 feet wide. The dam and reservoir are owned and operated by the Emporium Water Company. The visual inspection and review of engineering data, performed in November 1978 through January 1979, revealed necessary items of maintenance and rehabilitation for the dam. It is recommended that the owner repair the undermining of the right end of the spillway, monitor all seepage from the dam for quantity and turbidity, monitor and provide erosion protection at the left abutment hillside seepage, provide drainage for the marshy area downstream from the dam, repair the animal burrows in the embankment, implement a rodent control program, repair all eroded areas on the embankment and reseed as necessary, repair the spalled concrete on the intake structure, and develop and implement a maintenance schedule for all facilities.

AD-A070 601/0GA MF **A01**
Baker (Michael) Jr Inc Beaver Pa
National Dam Inspection Program. Saul Run Dam (NDI Number PA-00251, PennDER Number 43-48), Ohio River Basin, Saul Run, Mercer County, Pennsylvania. Phase I Inspection Report.
Apr 79, 72p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Flood control, Maintenance, Geology.
Identifiers: National Dam Inspection Program, *Saul Run Dam, Spillways, *PA-458 Dam.

Saul Run Dam, a flood water retarding dam designed by the U.S. Department of Agriculture, Soil Conservation Service (SCS), is also known by its SCS number PA-458. The homogeneous earth embankment has a crest length of approximately 1700 feet and a mixmum hength///eight of about 40 feet. The dam crest at El. 1113.6 feet has a width of 16 feet. The upstream slope has an inclination of 3H:1V (horizontal:vertical) and an 8-foot wide berm at El. 1085 feet. The downstream slope with an inclination of 2.5H:1V also has an 8-foot wide berm at El. 1084 feet. A foundation cutoff trench with a base width of 12 feet, 1H:1V side slopes, a length of about 100 feet, and a depth of about 5 feet to bedrock was constructed in the valley bottom (Plate 5). Cutoff trenches of similiar cross-section were also constructed in the soil abutments (Plate 5). The outlet works (principal spillway in SCS terminology) consist of a reinforced concrete riser connected to a 24-inch diameter reinforced concrete pipe is located beneath the embankment in the valley bottom. The outlet pipe, with six reinforced concrete anti-seep collars, was installed on a concrete cradle founded on bedrock.

AD-A070 602/8GA PC **A05**/MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Lake Hauto Dam (NDS Number PA-00606, DER Number 13-1), Delaware River Basin, Nesquehoning Creek, Carbon County, Pennsylvania, Phase I Inspection Report.
Feb 79, 79p
Contract DACW31-79-C-0012

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Civil engineering, Recreation, Reservoirs, Maintenance, Hydrology, Geology.
Identifiers: National Dam Inspection Program, *Lake Hauto Dam, Spillways.

The present Lake Hauto Dam was constructed from 1912 to 1914 and replaced a smaller dam located 350 feet upstream. The dam was designed by the Engineering Department of the American Pipe and Construction Company. Its Chief Engineer, J. W. Ledoux, made periodic inspection trips during construction, besides having a resident engineer engaged during the entire time of construction. The Contractor was McNichol Paving and Construction Company, Philadelphia. The dam was constructed for the Lehigh Coal and Navigation Company. The reservoir water was used as cooling water for a steam electric plant located south of the dam and for commercial water supply for collieries and washeries. The consulting firm Gannett, Seelye and Fleming, Inc., Harrsiburg, designed a two-foot high addition to the dam and an enlargement of the spillway capacity by widening the spillway. The spillway crest was also raised two feet. A suspension bridge was located across the spillway. PennDER objected to the low underclearance of this bridge and requested a replacement to prevent possible clogging up of the spillway. A drawing, dated 1920, indicates details of the present bridge supported on bent mine rails and presumably this bridge was extended in 1923 when the spillway was enlarged from 70 feet to 100 feet. The files did not contain an application or a permit for the construction of the bridge. In 1963 major repairs were made to the concrete weir and upstream part of the spillway slab and walls. (Author)

AD-A070 603/6GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Lofty Reservoir Dam (NDI Number PA-00681, DER Number 54-1), Susquehanna River Basin, Messers Run, Schuykill County, Pennsylvania. Phase I Inspection Report.
Apr 79, 73p
Contract DACW31-79-C-0012
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Reservoirs, Seepage, Geology, Water supplies.
Identifiers: National Dam Inspection Program, *Lofty Reservoir Dam, Spillways.

The Lofty Dam is an earthfill structure which was built in 1896-97. It was raised in elevation two times during its existence; once in 1912 and once in 1915. The 1915 modifications were not completed until 1922 because of a lack of funds. There were no major changes in the dam since 1922 and the embankment, spillway and outlet pipe of that design are reflected in the dam as it stands today. The embankment length is 1,100 feet and the spillway at the left abutment has a crest length of 29 feet. The spillway is a concrete broad crested weir with concrete side walls. The spillway apron is also concrete. The outlet feature of this dam is an 20-inch diameter pipe with a 20-inch control valve on the downstream end. The valve control is exposed, sitting at the existing ground surface. The upstream end of the 20-inch pipe is submerged and has no positive closure. The dam functioned as a reserve water supply source feeding the Blue Head Dam 2.7 miles downstream through the natural stream channel to which the spillway and outlet of Lofty Dam discharge.

AD-A070 604/4GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Mud Run Dam (NDI Number PA-00690, DER Number 54-27), Delaware River Basin, Mud Run, Schuylkill County, Pennsylvania. Phase I Inspection Report.
Apr 79, 73p
Contract DACW31-79-C-0012
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Reservoirs, Seepage, Maintenance, Records.
Identifiers: National dam inspection program, *Mud Run Dam, Spillways.

The Mud Run Dam was designed and constructed in 1879 by the Philadelphia and Reading Coal and Iron Company. It was described in a 1914 report as an earthfill structure 1,124 feet in length. Very little information could be obtained as to the original construction. It was reported that the ground surface was well plowed to form a good bond with the fill and that the material, which was a mixture of clay and disintegrated conglomerate, was laid in layers and rolled. The dam was practically rebuilt in 1903 by adding to the then existing structure. The centerline was moved 16 feet downstream and the dam crest was increased from 8 feet to 24 feet in width and raised five feet in elevation. The downstream slope was changed from 1-1/2H to 1V to 2H to 1V and both slopes were paved with riprap. The material used in the enlargement was clay and disintegrated conglomerate which was laid in layers from 6 inches to 8 inches and rolled. A concrete core wall five feet wide on top and ten feet wide at the bottom was carried through a previous layer of underlying sand and gravel.

AD-A070 605/1GA PC **A04**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. Dutch Fork Dam (NDI ID Number PA-490), Ohio River Basin, Dutch Fork, Washington County, Pennsylvania. Phase I Inspection Report.
Jan 79, 63p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Water supplies, Recreation, Hydrology, Geology, Maintenance.
Identifiers: National Dam Inspection Program, *Dutch Fork Dam, Spillways.

The Dutch Fork Dam consists of an earth embankment approximately 460 feet long with a maximum height of 42 feet from the downstream toe and a crest width of 12 feet. The flood discharge facilities for the dam consist of a combined primary and emergency spillway located on the left abutment (looking downstream). The spillway structures of the dam consist of a concrete overflow section, a trapezoidal concrete-lined spillway discharge channel which terminates in a concrete-lined plunge pool at the toe level of the dam near the left abutment. The overflow structure of the spillway is an 89-foot-long concrete weir, trapezoidal in cross section, located at an elevation approximately 10 feet below the dam crest. The outlet works consist of a reinforced concrete box culvert and a control tower located at the center of the embankment. The conduit is equipped with trask rack devices on the upstream end with a stilling basin at the discharge end. The flow through the conduit is controlled by stop logs located in the control tower. The stop logs divide the control tower into inflow and outflow chambers. The stop logs in the control tower extend from the invert elevation of the box culvert to the normal pool elevation. The flow entering into the intake chamber of the control tower through the upstream portion of the outlet conduit rises to the normal pool elevation, spills over the stop logs into the outflow chamber, which in turn discharges into the downstream portion of the outlet conduit. The lake can be drawn down below the normal pool elevation by removing the stop logs. The control tower is not equipped with any mechanical device for removing the stop logs. This

outlet system constitutes the emergency drawdown facility for the dam. (Author)

AD-A070 606/9GA PC **A05**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. Old DAM (NDI ID Number PA-499), Ohio River Basin, St. Patricks Run, Washington County, Pennsylvania. Phase I Inspection Report.
Jan 79, 77p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Maintenance, Deterioration, Embankments.
Identifiers: National Dam Inspection Program, *Old Dam, Spillways.

The Old Dam is an earth embankment. As it presently exists, the embankment is approximately 130 feet long with a maximum height of 38 feet from the downstream toe and a minimum crest width of approximately 8 feet. Review of the design drawings indicates that the embankment as built was 235 feet long. It appears that during the reconstruction of U.S. Route 22, which is approximately 200 feet downstream from the crest of the dam, a significant fill was placed on the left abutment, reducing the embankment to its present length. The flood discharge facilities for the dam consist of a combined primary and emergency spillway located on the left abutment (looking downstream). The overflow structure of the spillway is a 49-foot-wide stone overflow section which discharges initially into an earth channel and then into a trapezoidal concrete discharge channel which terminates at a point approximately 200 feet downstream from the toe of the dam in line with the right abutment. The outlet works for the dam as designed consisted of a 24-inch cast-iron pipe through the embankment equipped with a masonry intake structure at the upstream and and a valve at the downstream toe of the embankment. However, presently it appears that the inlet structure has collapsed and now is a mound of rubble. The owner reported that the valve at the downstream end of the outlet pipe has been dynamited in an attempt to drain the lake. The downstream end of the pipe could not be located. It apparently discharges under the surface of the pool of water at the downstream toe of the dam. The dam has no operable emergency drawdown facilities. (Author)

AD-A070 607/7GA PC **A05**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Safety Program. Ryerson Station State Park Dam (NDI ID-PA-193, DERID-30-20), Ohio River Basin, North Fork of Wheeling Creek, Greene County, Pennsylvania. Phase I Inspection Report,
Lawrence D. Anderson. Mar 79, 76p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Reservoirs, Seismic data, Maintenance.
Identifiers: National Dam Inspection Program, *Ryerson Station State Park Dam, Spillways.

Ryerson Station State Park Dam is a 515-foot-long concrete gravity structure. A 200-foot-long ogee section near the right abutment (looking downstream) is the combined primary and emergency spillway of the dam. The maximum height of the dam is about 30 feet for the spillway and 42 feet for the nonoverflow section measured from the downstream toe. The width of the dam varies from a minimum of 6 feet at the crest of the nonoverflow section to about 30 feet at the base of the dam. The outlet works for the dam consist of a 36-inch-diameter conduit through the dam left of the spillway. Flow through the outlet conduit is controlled by a manually operated sluice gate located at the upstream end. The outlet works constitute the emergency drawdown facility for the reservoir. The dam is located in Ryerson Station State Park approximately one mile upstream from the town of Ryerson Station in Richville Township, Greene County, Pennsylvania.

AD-A070 608/5GA PC **A05**/MF **A01**
Kimball (L Robert) and Associates Ebensburg PA
National Dam Inspection Program. Cabin Creek Dam (NDS I.D. PA-00336, DER I.D. 67-459), Susquehanna River Basin, Cabin Creek, York County, Pennsylvania, Red Lion Municipal Authority. Phase I Inspection Report,
R. Jeffrey Kimball, and Kuang-Hwei Chuang. Mar 79, 95p
Contract DACW31-79-C-0009
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Water supplies, Reservoirs, Geology, Maintenance.
Identifiers: National Dam Inspection Program, *Cabin Creek Dam, Spillways.

Cabin Creek Dam is an earth-fill dam with a concrete core wall. The embankment is 207 feet long and 23.2 feet high at the maximum section. The upstream slope is 2.25H:1V and covered with riprap. The downstream slope is 2H:1V and grass covered with large trees growing near the toe. The 18 inch wide core wall extends 2 feet into rock and projects 5 feet above rock. The foundation was grouted during construction. The spillway is located on the left abutment. The spillway consists of a 30 feet long concrete weir with a hydraulically operated Bascule crest gate. The spillway exit channel is cut into rock with a dry rubble, earth and rock dike keeping flow in a confined channel. The intake tower is located near the maximum section about 40 feet from the crest. A bridge serves as access from the embankment crest to the intake tower. A 12 inch cast iron pipe serves as the emergency blow off line and water intake line. The intake tower has two intakes at different elevations. (Author)

AD-A070 609/3GA MF **A01**
Kimball (L Robert) and Associates Ebensburg PA
National Dam Inspection Report. Laurel Dam (NDS I.D.-PA-00586, DER I.D.-21-25), Susquehanna River Basin, Mountain Creek, Cumberland County, Pennsylvania. Phase I Inspection Report,
R. Jeffrey Kimball, and Kuang-Hwei Chuang. Mar 79, 103p
Contract DACW31-79-C-0009
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Dams, *Inspection, *Structural analysis, Pennsylvania, Safety, Flood control, Maintenance.
Identifiers: National Dam Inspection Program, *Laurel Dam, Spillways.

Laurel Dam is a concrete gravity dam constructed in 1967. The dam is 25 feet high (32 feet above bedrock). The center overflow section consists of an ogee weir and is 200 feet long. The right abutment is a gravity non-overflow section. The left abutment consists of a 151 foot long non overflow concrete wingwall. This wingwall is 12.5 feet higher than the ogee crest. The drawdown conduit is a 3 feet by 5 feet concrete tunnel through the left abutment wingwall. The conduit is 29.5 feet long and is controlled by a sluice gate operated from the top of the wingwall. (Author)

AD-A070 612/7GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Greenwood Dam (NDS-PA-00701, DER-54-31), Delaware River Basin, Schuylkill County, Pennsylvania. Phase I Inspection Report.
Feb 79, 73p
Contract DACW31-79-C-0012
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Embankments, Geology, Maintenance.
Identifiers: National Dam Inspection Program, *Greenwood Dam, Spillways.

Greenwood Dam is an earthfill embankment, originally constructed in 1880. The embankment height was increased in 1901 or 1904 and again in 1935 to its present configuration. The length of the embankment is about 850 feet with a maximum height of 32 feet. Four 20-inch pipes are placed under the embankment with valves at the downstream end without control at the upstream end. The pipes are supported on a masonry wall. The outlets of these pipes are not visible because they are submerged under the backwater of the Lake Hauto Dam, which is located immediately downstream. The spillway is located in the left abutment, about 100 feet from the end of the dam. The spillway is a concrete ogee weir and the discharge channel is cut out of the rock. The length of the ogee section is 94.5 feet and the weir crest is 2.0 feet above the approach channel. The left side of the spillway is sloped and cement paved. The right side is a vertical wall of stone, laid in mortar.

AD-A070 613/5GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Sweet Arrow Lake Dam (NDI-PA-00680, DER-54-102), Susquenhanna River Basin, Schuylkill County, Pennsylvania. Phase I Inspection Report.
Apr 79, 114p
Contract DACW31-79-C-0012
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Water supplies, Reservoirs, Embankments, Geology.
Identifiers: National Dam Inspection Program, *Sweet Arrow Lake Dam, Spillways.

Sweet Arrow Lake Dam is an earthfill embankment with a maximum height of 35.5 feet. The length of the dam crest is about 480 feet. The ends of the embankment tie into the remains of an older and higher dam which failed, due to overtopping, in 1862. A cutoff trench was excavated to solid rock and a grout curtain was installed. The spillway, which has a crest elevation of 14.5 feet below the top of the dam is located in the west (left) abutment, and is separated by a high ridge from the embankment. The 50 feet wide spillway was excavated in rock and is unlined. An intake tower is located at the toe of the upstream slope. The intake is controlled by two 18-inch gate valves and the discharge is through a concrete conduit beyond the downstream toe of the dam.

AD-A070 614/3GA MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. Cherry Valley Dam (NDI-PA-508, DER-63-56), Ohio River Basin, Racoon Creek, Washington County, Pennsylvania. Phase I Inspection Report,
Lawrence D. Andersen. Mar 79, 68p
Contract DACW31-79-C-0014
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Water supplies, Reservoirs, Geology, Maintenance.
Identifiers: National Dam Inspection Program, *Cherry Valley Dam, Spillways.

The Cherry Valley Dam consists of an earth embankment approximately 475 feet long, with a maximum height of 33 feet from the downstream toe, and a crest width of 10 feet. The flood discharge facilities for the dam consist of a combined primary and emergency spillway located on the right abutment (looking downstream). The spillway structures consist of an approach channel, a concrete overflow section, a spillway discharge channel, and stilling basin. The overflow structure of the spillway is a 130-foot-long concrete ogee section located at an elevation approximately 7.5 feet below the dam crest. The flow from the overflow section discharges into a trapezoidal concrete discharge channel which terminates at a plunge pool at the toe level of the dam near the right abutment. The outlet works consist of a concrete intake tower and two 24-inch cast-iron pipes through the embankment located at the center of the dam. The pipes are encased in concrete through the embankment and are equipped with concrete cutoff collars. The pipes receive flow from the wet intake tower and discharge into the outlet works discharge channel near the downstream toe of the dam. Flow through the pipes is controlled by gate valves located in a concrete valve chamber at the downstream end. This outlet system constitutes the emergency drawdown facility for the dam.

AD-A070 615/0GA MF **A01**
Baker (Michael) Jr Inc Beaver PA

National Dam Safety Program. H. B. Norton Dam PA No Name No. 42 (NDI-PA-00385, PennDER No. 24-35), Ohio River Basin, Big Mill Creek, Elk County, Pennsylvania. Phase I Inspection Report,
C. Y. Chen. Feb 79, 94p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Water supplies, Maintenance, Seepage, Geology, Records.
Identifiers: National Dam Inspection Program, *H B Norton Dam, Spillways.

The H. B. Norton Dam consists of an earthfill embankment approximately 37 feet high and 675 feet long. A 75-foot wide, concrete ogee spillway is located at the right abutment, and a 150-foot wide emergency spillway is located at the left abutment. Seepage control is provided by a steel core wall comprised of 72-inch by 96-inch by 1/4-inch steel sheets, which are riveted and welded in place. The downstream embankment rises at a slope of 2 horizontal to 1 vertical (2H:1V) to the crest at elevation 1422.4 feet. The upstream slopes rise at 2.5H:1V to elevation 1412 feet and then 2H:1V to the 12-foot wide crest. The upstream face is lined with well-placed sandstone riprap, typically 1- to 2-foot square. The ogee type spillway has a crest elevation of 1415 feet, or 7 feet lower than the top of dam. Approximately 225 feet to the left of the ogee spillway is a concrete screen chamber built into the embankment. The intake consists of two pipes, a 16-inch cast-iron pipe with an invert elevation of 1400 feet and a 36-inch cast-iron pipe with an invert at elevation 1386.0 feet.

AD-A070 616/8GA MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Tamarack Lake Dam 'A' (NDI-PA-00181, PennDER No. 20-47A, SCS No. PA-461A), Ohio River Basin, Mill Run, Crawford County, Commonwealth of Pennsylvania. Phase I Inspection Report,
C. Y. Chen. May 79, 95p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Reservoirs, Maintenance, Seismic data, Seepage.
Identifiers: National Dam Inspection Program, *Tamarack Lake Dam, Spillways.

Tamarack Lake is impounded by two separate dams at opposite ends of the reservoir. Tamarack Lake Dam 'A' is located at the northern end of the reservoir and consists of a main embankment, emergency spillway channel, riser intake and outlet conduit, and a diversion dam located to the left of the emergency spillway channel. Tamarack Lake Dam 'B' is located at the southern end of the reservoir and consists of a main embankment, emergency spillway channel, riser intake and outlet conduit, and a saddle dike located to the left of the emergency spillway channel. Tamarack Lake Dam 'A' is 22 feet high and approximately 1000 feet long. A clay core and cutoff trench extend throughout the length of the dam. The minimum width of the core and cutoff trench is 10 feet. The cutoff trench varies in depth below the original ground surface from 4 to 13 feet with the lowest elevation (1195.0 feet) near the location of the outlet conduit.

AD-A070 620/0GA PC **A04**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. PA-484 Dam (NDI-ID-PA-489) (DER ID-63-72) Ohio River Basin, Tributary of Harmon Creek, Washington County, Pennsylvania. Phase I Inspection Report.
Mar 79, 74p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Flood control, Reservoirs, Maintenance, Seismic data.
Identifiers: National Dam Inspection Program, *PA-484 Dam, Spillways, Harmon Creek.

The PA-484 Dam is one of the 14 flood control projects in the Harmon Creek watershed. The dam consists of an earth embankment approximately 320 feet long, with a maximum height of 67 feet from the downstream toe and a crest width of 14 feet. The flood discharge facilities for the dam consist of a drop inlet primary spillway located at the center of the embankment and an emergency spillway on the left abutment (looking downstream). The primary spillway structures consist of a two-stage reinforced concrete riser, a 24-inch-diameter reinforced concrete conduit and a reinforced concrete impact basin at the downstream end of the outlet conduit. The emergency spillway is a 50-foot-wide trapezoidal earth channel excavated into the left abutment. The reservoir outlet for the dam consists of a 12-inch steel pipe extending from the upstream toe of the dam to the drop inlet structure. Flow through the reservoir outlet is controlled by a manually operated sluice gate located in the drop inlet structure. The dam is located on an unnamed tributary of Harmon Creek approximately one mile west of Hanlon Station in Hanover Township, Washington County, Pennsylvania.

AD-A070 621/8GA PC **A04**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. Lower Hereford Manor Dam (NDI-ID-PA-261) (DER-ID-4-47). Ohio River Basin, Doe Run, Beaver County, Pennsylvania.
Mar 79, 53p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Reservoirs, Stability, Maintenance, Seepage, Geology.
Identifiers: National Dam Inspection Program, *Lower Hereford Manor Dam, Spillways.

The Lower Hereford Manor Dam consists of an earth embankment approximately 1000 feet long with a maximum height of 37 feet from the downstream toe and a crest width of about 25 feet. The flood discharge facilities for the dam consist of a combined primary and emergency spillway located on the right abutment (looking downstream). The spillway is a rectangular concrete channel 17 feet wide, equipped with flashboards and a fish screen. The tops of the flashboards are at a level about two feet below the low spot on the embankment crest. The spillway discharge channel is a trapezoidal earth channel excavated across the drainage divide on the right abutment and discharging into Buck Run. The dam has no low-level outlet. The dam is located approximately 1-1/2 miles northeast of Zelienople along State Route 288 in Franklin Township, Beaver County, Pennsylvania.

AD-A070 624/2GA PC **A08**/MF **A01**
Army Engineer District Philadelphia PA
Long Range Spoil Disposal Study. Part II. Substudy 1. Short Range Solution.
Jun 69, 174p
See also Part 4, Substudy 3, AD-A070 625.

Descriptors: Channels(Waterways), Dredging, *Delaware Bay, Maintenance, Navigation, Land use, Site selection, Public administration, Wildlife, Water resources, Urban planning.
Identifiers: *Solid waste disposal, Right of way acquisition, Earth fills, Marshes, Fishes, Wildlife, Fees, Delaware Valley, Shoaling, Delaware Bay Region(United States).

The goal of this study is to locate and obtain, either by fee or easement acquisition, disposal areas which are within economic pumping distance of the dredging requirement. This goal, however, has its limiting factors. Vast land areas along the Delaware River have already been consumed with dredged fill. Marsh and low lands have been filled; many of those remaining have been designated fish and wildlife or water resource areas. Landowners have been reluctant to enter into long term spoil disposal easements where the filling of their land does not result in land enhancement. Proposed fee acquisition of potential disposal areas has met with intense landowner opposition and opposition from local, county and state officials. The urban Greater Delaware Valley is rapidly expanding and potential disposal areas are being consumed by industrial development. Pressures are also being exerted on the Government for relinquishment of present disposal area holdings so that the real estate may be developed industrially and local tax revenue may become available. The only large acreage readily discernible for development into disposal areas is in the Delaware Bay regions which is 25 to 50 miles below the repetitive shoaling areas. (Author)

AD-A070 625/9GA PC **A05**/MF **A01**
Army Engineer District Philadelphia PA
Long Range Spoil Disposal Study. Part IV. Substudy 3. Development of New Dredging Equipment and Technique.
Jun 69, 79p
See also Part 5, Substudy 4, AD-A070 626.

Descriptors: Channels(Waterways), Dredging, *Delaware Bay, Waste management, Maintenance, Dredged materials, Commercial equipment, Pumps, Sampling.
Identifiers: *Dredge spoil, *Solid waste disposal, Channel improvements, Transportation, Delaware River channel.

The object of this study is to examine present dredging technology for the purpose of selecting, improving, or conceiving better equipment and technique for maintaining the Delaware River Channel under the future situation where dredged material will need to be transported long distances (25-50 miles). (Author)

AD-A070 626/7GA PC **A03**/MF **A01**
Army Engineer District Philadelphia PA
Long Range Spoil Disposal Study. Part V. Substudy 4. Pumping Through Long Lines.
Jun 69, 41p
See also Part 6, Substudy 5, AD-A070 627.

Descriptors: Channels(Waterways), Dredging, Delaware Bay, Feasibility studies, Pumps, *Pumping, *Pipelines, Transportation.
Identifiers: *Dredge spoil, Cost analysis, Comparison, Volume.

This study inquires into the feasibility and practicality of pumping dredge spoil long distances. The purpose of the proposed operation is to deliver dredge spoil by pipeline to locations far removed from its origin. The study concludes that transport of dredged spoil by pipeline over long distances is feasible technologically and will cost about $0.01/cu. yd. for each mile the spoil is transported. It is acknowledged that this transport cost exceeds the cost of transport of dredge spoil by waterborne cargo carrier which is studied in Sub Study No. 3. Therefore, the study concludes that the best promise for utilizing the discussed technique would be in connection with a large capacity inland source which would be enhanced by the dredged spoil. (Author)

AD-A070 627/5GA PC **A03**/MF **A01**
Army Engineer District Philadelphia Pa
Long Range Spoil Disposal Study. Part VI. Substudy 5. In-River Training Works.
Jun 69, 38p
See also Part 7, Substudy 6, AD-A070 628.

Descriptors: Channels(Waterways), *Dredging, *Delaware Bay, River currents, Downstream flow, Salinity, Maintenance, Cost effectiveness, Shores, Shallow water.
Identifiers: *Education, Shoaling, *Solid waste disposal, Estuaries.

It is apparent that the changes in river sections that would result from extreme canalizing of the estuary would not induce the necessary downstream shift of the shoaling due to the effect of salinity density currents. Extensive training works to reduce the flow area also were ineffective in moving the several shoaling areas downstream enough to be of benefit in reducing the cost of maintenance. Since the shoals cannot be moved out of the present high shoaling areas with the aid of training works regardless of cost, it will be necessary to develop improved and more efficient methods of dredging and disposing of material from the existing system.(Author)

AD-A070 628/3GA PC **A03**/MF **A01**
Army Engineer District Philadelphia PA

Long Range Spoil Disposal Study. Part VII. Substudy 6. Delaware River Anchorages,
J. F. Phillips, Carl C. Cable, Lewis Caccese, F. L. Sivard, and L. A. Duscha. Jun 69, 32p
See also Part 2, Substudy 1, AD-A070 624.

Descriptors: Channels(Waterways), *Dredging, Delaware Bay, Anchors(Structural), Federal law, Water traffic, Commercial equipment, Accident investigations, Cost effectiveness, Navigation, Waste management.
Identifiers: *Mantua Creek, Channel improvements, Reed Point, Delaware.

This is a reconsideration of the merits of enlarging Mantua Creek Anchorage and providing an improved anchorage off Reedy Point, Delaware and off Deepwater, Delaware as authorized by the River and Harbor Act of 3 July 1958. The reconsideration was made by analyzing current need, use of established anchorages, changing shipping patterns, the shortage of disposal areas, the multimillion dollar initial cost of anchorages, and their high maintenance cost. The report concludes that further investment in enlargement of anchorages would provide a benefit to cost ratio of .15 to 1 and is without merit from any reasonable viewpoint. (Author)

AD-A070 676/2GA PC **A05**/MF **A01**
Middlebrooks and Associates Logan UT
Energy Requirements for Small Flow Wastewater Treatment Systems.
Special rept.,
E. Joe Middlebrooks, and Charlotte H. Middlebrooks. Apr 79, 89p CRREL-SR-79-7
Contract DACA89-77-C-1915

Descriptors: *Waste water, Military facilities, Energy consumption, Tables(Data), Estimates, Land use, Sludge, Ground water, Ponds, Filtration.
Identifiers: *Energy requirements, Energy demand, *Sewage treatment.

This report summarizes energy requirements for small wastewater treatment systems (0.05 - million gallons per day) applicable to military installations. It compares various treatment combinations, and presents the energy requirements for the most viable alternatives in tabular form. It also presents energy requirements for various components of wastewater treatment systems in a format making it convenient to calculate the energy requirements for many combinations of the components. In addition, it summarizes briefly energy estimates made by others. The report compares typical combinations of unit operations and processes used to produce various quality effluents on the basis of energy consumption. It concludes that land application systems are the most energy-efficient wastewater treatment systems and that they are capable of producing an equivalent or higher quality effluent than any other treatment system. (Author)

AD-A070 691/1GA MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Bradford City Number 3 Dam (NDI-PA-00025, PennDER Number 42-10), Ohio River Basin, Marilla Brook, McKean County, Pennsylvania. Phase I Inspection Report,
C. Y. Chen. Feb 79, 80p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Bradford City Number 3 Dam, National Dam Inspection Program.

Bradford City No. 3 Dam consists of a diaphragm earthfill embankment approximately 47 feet high and 770 feet long. A core wall consisting of mortar and sandstone blocks was constructed in the center of the embankment. The core wall extends 25 feet into each hillside and approximately 9 feet below the original ground surface at the deepest point in the center of the valley. The visual inspections and review of engineering data, performed in November 1978 through February 1979, indicate no serious deficiencies in the embankment requiring emergency attention. The dam was found to be in good overall condition at the time of inspection. However, the inspection revealed certain items of maintenance and rehabilitation necessary for the dam. Hydraulic/hydrologic evaluations revealed that the spillway will not pass the Probable Maximum Flood (PMF) without overtopping the dam. The spillway is considered 'inadequate' because the analysis indicated the spillway will pass a maximum of 45 percent of the PMF before overtopping the dam, and failure of the dam is not likely to occur under 50 percent PMF conditions.

AD-A070 692/9GA MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Tamarack Lake Dam 'B' (NDI-PA-00746, PennDER-20-47B, SCS-PA-461B), Ohio River Basin, Mud Run, Crawford County, Pennsylvania. Phase I Inspection Report,
C. Y. Chen. May 79, 79p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Tamarack Lake Dam B, National Dam Inspection Program.

Tamarack Lake is impounded by two separate dams at opposite ends of the reservoir. Tamarack Lake Dam 'B' is located at the southern end of the reservoir and Tamarack Lake Dam 'A' is located at the northern end of the reservoir. Tamarack Lake Dam 'B' is a homogeneous earth dam designed by the Soil Conservation Service (SCS), U.S. Department of Agriculture. This multi-purpose reservoir and dam is presently owned and operated by the Pennsylvania Fish Commission. The dam has a crest length of 425 feet and a maximum height of 21 feet. A 6-foot-high dike was constructed in a saddle area to the left of the emergency spillway channel. Tamarack Lake Dam 'B' is classified as a 'High' hazard-'Intermediate' size dam. The dam was found to be in good overall condition at the time of inspection. Hydraulic/hydrologic evaluations revealed that the spillways will pass the Probable Maximum Flood (PMF) without overtopping the dam. The spillways are therefore considered 'adequate.'

AD-A070 693/7GA MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Eaton Dam (Bull Reservoir) (NDI-PA-00016, PennDER-25-34), Ohio River Basin, Tributary to French Creek, Erie County, Pennsylvania. Phase I Inspection Report,
C. Y. Chen. May 79, 77p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Maintenance, Water supplies, Reservoirs, Geology.
Identifiers: National Dam Inspection Program, *Eaton Dam, Spillways, Bull Reservoir.

Eaton Dam (also known as Bull Reservoir) is an earth embankment, straight in plan, with a spillway channel in excavation around its right end. The embankment has a maximum height of 22 feet and a length of 840 feet. The upstream slope is 3H:IV (Horizontal to Vertical), the downstream slope is 2H:IV, and the crest is 20 feet wide. The 14-inch cast-iron pipe outlet was laid in an excavation on a concrete cradle provided with concrete cutoffs. The control valve is located in a tower in the upstream slope is provided with riprap and the downstream slope is grass covered. The 20-foot wide clay core of the dam extends throughout the entire length of the embankment. Eaton Dam is located in a small drainage area tributary to French Creek, approximately 4.5 miles southeast of the Borough of North East, Erie County, Pennsylvania, less than 0.5 mile from the Pennsylvania-New York border.

AD-A070 694/5GA MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Bradford City Number 2 Dam (NDI-PA-00024, PennDER-42-8), Ohio River Basin, Gilbert Run, McKean County, Pennsylvania. Phase I Inspection Report,
C. Y. Chen. Feb 79, 82p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Bradford City Number 2 Dam, National Dam Inspection Program.

Bradford City No. 2 Dam is a diaphragm earthfill embankment dam with a maximum height of 44 feet and a crest length of 920 feet. Discharge is provided by an uncontrolled chute spillway located at the right abutment. The dam is owned and operated by the Bradford City Water Authority for water supply. The visual inspection and review of engineering data, performed in November 1978 through January 1979, indicate no serious deficiencies requiring emergency attention. The dam was found to be in fair overall condition at the time of inspection. However, the owner should immediately retain a qualified consultant for additional investigation of certain features. Hydraulic/hydrologic evaluations revealed that the spillway will not pass the Probable Maximum Flood (PMF) without overtopping the dam. Further, the spillway is considered 'inadequate' because the spillway will pass approximately 38 percent of the PMF before overtopping and failure is not likely to occur under the 50 percent PMF condition.

AD-A070 695/2GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Minersville Dam Number 4 (NDI-PA-00675, DER-54-39), Delaware River Basin, Schuylkill County, Pennsylvania. Phase I Inspection Report.
Apr 79, 64p
Contract DACW31-79-C-0002
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Dams, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs, Pennsylvania.
Identifiers: *Minersville Dam Number 4, National Dam Inspection Program.

The dam, as it now stands, is a rockfill dam with a concrete core wall. This wall is founded on rock. The top of the core wall is at elevation 1432.5 which is 2.5 feet below the crest elevation of the embankment at elevation 1435.0. (Note: Project datum is 25 feet less than the USGS elevations). Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in good condition. The hydrologic and hydraulic calculations indicate that the spillway for this dam has the capacity for passing 47 percent of the Probable Maximum Flood (PMF) without overtopping the embankment. Although 1/2 PMF will cause some overtopping, the depth of flow due to the overtopping is less than that judged to cause failure and therefore, the spillway, while inadequate, is not considered seriously inadequate.

AD-A070 696/0GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Upper Owl Creek Dam (NDS-PA-00673, DER-54-96), Delaware River Basin, Schuylkill County, Pennsylvania. Phase I Inspection Report.
Feb 79, 75p
Contract DACW31-79-C-0012
Availability: Microfiche copies only.

Descriptors: *Earth dams, Pennsylvania, Visual inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Upper Owl Creek Dam, National Dam Inspection Program.

Upper Owl Creek Dam is an earthfill embankment with a concrete core wall located on the centerline of the dam. The 9-inch thick concrete core wall is founded on rock over most of its length. The left

end of this wall is founded on sandy clay. The embankment has a length of approximately 1300 feet with a maximum fill height of 38 feet. The spillway is located in the right abutment and has a crest length of 50 feet at approximately 4 feet below the top of dam. Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in fair condition. In accordance with the Corps of Engineers' evaluation guidelines, the spillway capacity is inadequate to pass the PMF (Probable Maximum Flood) peak inflow without overtopping the dam. The project is capable of passing 45 percent of the PMF without overtopping.

AD-A070 697/8GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Speedwell Forge Dam (NDS-PA-00345, DER-36-257), Susquehanna River Basin, Lancaster County, Pennsylvania. Phase I Inspection Report.
Feb 79, 76p
Contract DACW31-79-C-0012
Availability: Microfiche copies only.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Speedwell Forge Dam, *Hammer Creek Dam, National Dam Inspection Program.

Speedwell Forge Dam, formerly known as Hammer Creek Dam, is a zoned earthfill dam with a maximum height of 35 feet above the streambed. The embankment length is 830 feet and the top of dam has a width of 18 feet. A cutoff trench was excavated along the centerline of the dam to the top of solid rock. A 120 foot long trapezoidal spillway weir is located in the right abutment at an elevation of 10 feet below the top of the dam. The concrete spillway ends in a stilling basin, from which the water flows through a riprap lined discharge channel to the original creekbed. A concrete control tower is located upstream just off the breast of the dam. Discharge through a 4-foot square concrete conduit is regulated either by stop logs or by opening a 30-inch sluice gate. Based on the visual inspection, past performance and the available engineering data, the dam and its appurtenant structures appear to be in good condition. The hydrologic and hydraulic calculations indicate that the spillway for this dam has the capacity for passing 47 percent of the Probable Maximum Flood (PMF) without overtopping the embankment.

AD-A070 698/6GA MF **A01**
Berger Associates Inc Harrisburg PA
National Dam Inspection Program. Stovers Dam (NDS-PA-00600, DER-38-5), Susquehanna River Basin, Lebanon County, Pennsylvania. Phase I Inspection Report.
Feb 79, 93p
Contract DACW31-79-C-0012
Availability: Microfiche copies only.

Descriptors: *Earth dams, Embankments, Inspection, Safety, Structural properties, Reliability, Reservoirs, Pennsylvania.
Identifiers: *Stovers Dam, Brandywine Creek, Spillways, National Dam Inspection Program.

Stovers Dam is a 160 + or - year old earthfill embankment with a masonry spillway at its left end. The length of the embankment is approximately 250 feet and the maximum height is 25 feet. The 18 foot wide broadcrested spillway was originally three feet below the top of the dam, but has been raised a few inches. A gate structure, located on the upstream side, has been sealed off and the control on the 12-inch blowoff pipe is located in a valve pit near the downstream toe. This pipe is the only known pipe in the embankment and has no upstream closure control. Location: City of Lebanon and North Lebanon Township, Lebanon County, U.S. Quadrangle, Lebanon, PA.

AD-A070 699/4GA MF **A01**
GAI Consultants Inc Monroeville PA
National Dam Inspection Program. Pike Township Municipal Authority Dam (NDS-ID-PA-00916, PennDER ID-17-111), Susquehanna River Basin, Bear Run, Clearfield County, Pennsylvania. Phase I Inspection Report,
Bernard M. Mihalcin. Apr 79, 84p
Contract DACW31-79-C-0013
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, *Inspection, *Structural analysis, Safety, Pennsylvania, Water supplies, Maintenance, Reservoirs, Embankments.
Identifiers: National Dam Inspection Program, *Pike Township Municipal Authority Dam.

Bear Run Dam is an earth embankment approximately 42 feet high and 415 feet long (including spillway). The dam is provided with an unlined trapezoidal channel spillway cut into the left abutment. The spillway contains a short concrete control slab adjacent to the embankment crest. The downstream channel of the spillway is comprised of unvegetated granular material. The outlet works consists of a 16-inch diameter ductile iron pipe (blowoff) with a sluice gate located at the inlet and controlled by a manual operator from the dam crest. An 8-inch diameter ductile iron pipe with a perforated vertical intake riser serves as the supply lines are equipped with two gate valves that are manually operated from the crest and downstream slope. Bear Run is located on Bear Run in Pike Township, Clearfield County, Pennsylvania, about 4-1/2 miles west of the community of Bridgeport (located along Anderson Creek) and about 6 miles west of the community of Curwensville.

AD-A070 700/0GA MF **A01**
GAI Consultants Inc Monroeville PA
National Dam Inspection Program. Jeannette Dam (NDS I.D.-PA-00486), (PennDER I.D.-65-9), Ohio River Basin, Unnamed Tributary to Brush Creek, Westmoreland County, Pennsylvania. Phase I Inspection Report.
Apr 79, 104p
Contract DACW31-79-C-0013
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, Embankments, Inspection, Safety, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *Jeannette Dam, Brush Creek, Spillways, National Dam Inspection Program.

Jeannette Dam is a 36-foot high earth dam approximately 480 feet in length. The dam impounds a small 10-acre reservoir locally known as Mountain Valley Lake. The facility is equipped with a small concrete and masonry spillway located approximately 35 feet upstream of the embankment along the western shore of the lake. The spillway discharges into a trapezoidal-shaped diversion channel which parallels the western shore. A historical report indicates that the diversion channel, approximately 1500 feet in length, was designed to divert all stream inflow completely around the reservoir and that water was piped to the reservoir from other impoundments. Jeannette Dam is located across a small branch of Brush Creek approximately 2.5 miles west of Greensburg, in Hempfield Township, Westmoreland County, Pennsylvania.

AD-A070 711/7GA MF **A01**
Kimball (L Robert) and Associates Ebensburg PA
National Dam Inspection Program. W. H. Walker Dam - Mountain Lake Reservoir, (NDS I.D.-PA-00325) (DER I.D.-28-37), Potomac River Basin, West Branch of Conococheague Creek, Franklin County, Pennsylvania. Mountain Lake Corporation. Phase I Inspection Report.
Mar 79, 90p
Contract DACW31-79-C-0009
Original contains color plates: All DDC and NTIS reproductions will be in black and white.
Availability: Microfiche copies only.

Descriptors: *Earth dams, Embankments, Inspection, Safety, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *W H Walker Dam, Mountain Lake Reservoir, Conocoheague Creek, Spillways, National Dam Inspection Program.

The assessment of W.H. Walker Dam is based upon visual observations made at the time of inspection, review of available records and data, hydrologic and hydraulic computations, and past operational performance. W.H. Walker Dam, Mountain Lake Reservoir, consits of an earthfill dam with a concrete corewall. The dam is 500 feet long and 21 feet high from the downstream toe. The downstream slope is approximately 2H:1V and the upstream slope 1.5H:1V. The upstream slope has riprap protection. The crest is approximately 12 feet wide and forms an access road to the spillway. The spillway is a 175 feet long concrete gravity overflow section located at the right abutment. An abandoned powerhouse is located between the earth embankment section and the concrete spillway. The outlet works consists of a 30 inch pipe. The dam is located on the West Branch Conocoheague Creek, approximately one half mile southeast of Fannettsburg, Pennsylvania.

AD-A070 712/5GA PC **A05**/MF **A01**
Kimball (L Robert) and Associates Ebensburg PA
National Dam Inspection Program. Licking Creek Dam - Clearview Reservoir (NDS-PA-00581) (DER-34-01), Susquehanna River Basin, Licking Creek, Juniata County, Pennsylvania. Mifflintown Municipal Authority. Phase I Inspection Program.
Mar 79, 93p
Contract DACW31-79-C-0009
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Embankments, Inspection, Safety, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *Licking Creek Dam, Clearview Reservoir, Spillways, National Dam Inspection Program.

Licking Creek Dam is an earthfill dam with a concrete corewall. The embankment is 700 feet long and 26 feet high at the maximum section. The 2 foot thick concrete core wall is reported to have been placed on the upstream side of the dam axis well into bedrock (some 30 feet below streambed) and extends halfway to the top of the dam. Above the concrete wall is an 18 inch thick rubble masonry wall extending to within 4.5 feet of the top of dam. This rubble masonry wall is constructed on the upstream face and also provides protection against wave action. Above the rubble wall is riprap. The dam is located on Licking Creek, approximately 5.5 miles west of Mifflin, Juniata County, Pennsylvania.

AD-A070 713/3GA PC **A05**/MF **A01**
Gannett Fleming Corddry and Carpenter Inc Harrisburg PA
National Dam Inspection Program. Campbells Ledge Dam (NDI I.D.-PA-00649 DER I.D.-40-19), Susquehanna River Basin, Campbells Ledge Creek, Luzerne County, Pennsylvania. Pennsylvania Gas and Water Company. Phase I Inspection Report.
Jan 79, 90p
Contract DACW31-79-C-0015

Descriptors: *Earth dams, Embankments, Inspection, Safety, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *Campbells Ledge Dam, Spillways, National Dam Inspection Program.

Campbells Ledge Dam is two homogeneous earthfill embankments, both with reinforced-concrete core walls. The embankments are located at either end of the reservoir, which extends in a north-south direction. The north, or upstream, embankment is 590 feet long and 12 feet high at its maximum section. A canal flows into the reservoir at the east end of the embankment. The canal carries discharges from Falling Springs Dam. The flows are diverted into the canal to Campbells Ledge Dam by the Falling Springs Diversion Structure. The north embankment has no outlet works or spillway. The south, or downstream, embankment is 750 feet long and 33 feet high at its maximum section. A morning glory spillway, whose variable crest elevation weir is 14 feet in diameter, is located near the middle of the embankment. The dam is located on Campbells Ledge Creek, 1.5 miles northwest of Duryea, Pennsylvania.

AD-A070 714/1GA PC **A05**/MF **A01**
Gannett Fleming Corddry and Carpenter Inc Harrisburg PA

National Dam Inspection Program. Olyphant Number 3 Dam (NDI I.D.-PA-00381 DER-I.D.-35-03), Susquehanna River Basin, Grassy Island Creek, Lackawanna County, Pennsylvania. Pennsylvania Gas and Water Company. Phase I Inspection Report.
Jan 79, 85p
Contract DACW31-79-C-0015

Descriptors: *Earth dams, Embankments, Inspection, Safety, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *Olyphant Number 3 Dam, Grassy Island Creek, National Dam Inspection Program.

Olyphant No. 3 Dam is an earthfill embankment 760 feet long and 37 feet high at its maximum section. The embankment has a puddled impervious core and riprap on both the upstream and downstream slopes. The spillway is located at the right abutment of the dam. It is an excavated, riprapped channel with irregular geometry. The invert of the channel is 2.6 feet below the design level of the top of the dam. A 12-inch diameter cast-iron pipe with a valve at the downstream end extends through the center of the embankment and regulates flows. Olyphant No. 2 Dam is 0.5 mile downstream. The dam is located on Grassy Island Creek approximately 1.7 miles east of the Village of Winton, Pennsylvania.

AD-A070 715/8GA MF **A01**
Gannett Fleming Corddry and Carpenter Inc Harrisburg PA
National Dam Inspection Program. Maple Lake Dam (NDI-PA-00294 DER-35-42), Susquehanna River Basin, Rattlesnake Creek, Lackawanna County, Pennsylvania. Pennsylvania Gas and Water Company. Phase I Inspection Report.
Jan 79, 92p
Contract DACW31-79-C-0015
Availability: Microfiche copies only.

Descriptors: *Earth dams, Embankments, Inspection, Safety, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *Maple Lake Dam, Rattlesnake Creek, Spillways, National Dam Inspection Program.

Maple Lake Dam consists of a homogeneous earthfill embankment. The embankment is 490 feet long and 23 feet high at the maximum section. The spillway is an irregular excavated channel at the right abutment of the dam. An outlet works with a 24-inch diameter cast-iron pipe and a valve at the downstream toe is located near the middle of the embankment. A dike is located about 500 feet right of the embankment. It is 284 feet long and 3 feet high at maximum section. The dam is located on Rattlesnake Creek approximately 3.4 miles west of Moscow, Pennsylvania.

AD-A070 716/6GA PC **A06**/MF **A01**
Gannett Fleming Corddry and Carpenter Inc Harrisburg PA
National Dam Inspection Program. Lake Carey Dam (NDI-PA-00887 DER-66-06), Susquehanna River Basin, Mill Brook, Wyoming County, Pennsylvania. Lake Carey Welfare Association, Inc. Phase I Inspection Report.
Jan 79, 115p
Contract DACW31-79-C-0015

Descriptors: *Earth dams, Embankments, Inspection, Safety, Hydrology, Operational effectiveness, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *Lake Carey Dam, Mill Brook(Pennsylvania), Spillways, National Dam Inspection Program.

Lake Carey Dam is an earthfill embankment with a vertical, mortarless, stone masonry downstream face. The dam extends 110 feet across the valley and is 13 feet high. A concrete and stone masonry spillway chute, with a crest length of 19.3 feet, is situated on the embankment near the right abutment. The spillway crest is 3.7 feet below the top of the dam. An auxiliary spillway channel, with irregular cross section and with a crest about 0.7 foot below the top of the dam, is located at the right abutment. Before the dam was constructued, Lake Carey was a natural lake. The dam is located on Mill Brook approximately 3.2 miles northeast of Tunkhannock, Pennsylvania.

AD-A070 717/4GA PC **A06**/MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Union City Reservoir Dam (NDI-PA-00019 PennDER-25-3), Ohio River Basin, Bentley Run, Erie County, Pennsylvania. Phase I Inspection Report.
May 79, 103p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Embankments, Inspection, Safety, Hydrology, Operational effectiveness, Structural properties, Reliability, Streams, Reservoirs, Pennsylvania.
Identifiers: *Union City Reservoir Dam, Spillways, National Dam Insptection Program.

Union City Reservoir Dam is an earthfill embankment dam with a clay puddle core and concrete cutoff wall. The dam, which is approximately 250 feet long and 36 feet high, is owned and operated by the Borough of Union City. Union City Reservoir Dam is categorized as a 'High' hazard-'Small' size dam.

AD-A070 718/2GA PC **A05**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. PA-647 Dam (NDI ID Number PA-812, DER ID Number 63-76), Ohio River Basin, Robinson Fork, Washington County, Pennsylvania. Phase I Inspection Report.
Mar 79, 80p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *PA-647 Dam, Wheeling Creek, National Dam Inspection Program.

The PA-647 dam is one of the seven flood control structures in the Wheeling Creek watershed. The dam consists of an earth embankment approximately 500 feet long with a maximum height of 95 feet from the downstream toe and a crest width of 15 feet. The flood discharge facilities for the dam consist of a drop inlet type primary spillway located near the left abutment (looking downstream) and an emergency spillway on the right abutment. Based on the evaluation of the conditions as they existed on the dates of inspection and as revealed by visual observations, the condition of PA-647 dam is considered to be good. The spillway capacity is classified to be adequate according to the recommended criteria.

AD-A070 719/0GA PC **A04**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. Waynesburg Water Company Dam (NDI ID Number PA-195), Ohio River Basin, Wisecarver Run, Green County, Pennsylvania. Phase I Inspection Report.
Jan 79, 71p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Pennsylvania, Visual inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Waynesburg Water Company Dam, National Dam Inspection Program.

The Waynesburg Water Company Dam consists of an earth embankment approximately 260 feet long with a maximum height of 33 feet from the downstream toe and a crest width of 17 feet. The flood discharge facilities for the dam consist of a combined primary and emergency spillway located on the left abutment (looking downstream). The overflow structure of the spillway is a 55-foot-long concrete ogee section located at an elevation approximately 6 feet below the dam crest. The flow from the overflow section discharges into a rectangular concrete discharge channel which terminates at a plunge pool at the toe level of the dam near the left abutment. The outlet works consist of a 16-inch cast-iron combined blow-off and supply pipe located near the left abutment. Based on the evaluation of the conditions as they existed on the dates of inspection and as revealed by visual observations, the condition of the Waynesburg Water Company Dam is assessed to be good. According to the recommended criteria, the spillway capacity (30 percent PMF) is classified as seriously inadequate because it will not pass the recommended spillway design flood of half to full probable maximum flood (PMF) without overtopping, and it was judged that failure of the dam resulting from overtopping would significantly increase the downstream hazard of loss of life compared to the hazard which would exist just before failure.

AD-A070 720/8GA PC **A04**/MF **A01**
D'Appolonia Consulting Engineers Inc Pittsburgh PA
National Dam Inspection Program. PA-479 Dam (NDI ID Number PA-509, DER ID Number 63-71), Ohio River Basin, Harmon Creek, Washington County, Pennsylvania. Phase I Inspection Report.
Mar 79, 75p
Contract DACW31-79-C-0014
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *PA-479 dam, Harmon Creek, National Dam Inspection Program.

The PA-479 dam is one of the 14 flood control projects in the Harmon Creek watershed. The dam consists of an earth embankment approximately 650 feet long with a maximum height of 63 feet from the downstream toe and a crest width of 14 feet. The flood discharge facilities for the dam consist of a drop inlet primary spillway located near the left abutment (looking downstream) and an emergency spillway, also located on the left abutment. Based on the evaluation of the conditions as they existed on the dates of inspection and as revealed by visual observations, the condition of PA-479 dam is assessed to be good. The spillway capacity is classified as adequate according to the recommended criteria.

AD-A070 799/2GA PC **A03**/MF **A01**
Illinois State Water Survey Urbana
Industrial Water Treatment Technology Transfer, Techniques and Management.
Final rept. Jul 76-Nov 78,
Russell W. Lane, and Chester H. Neff. Feb 79, 42p CEEDO-TR-79-01
Contract F41689-77-C-0029

Descriptors: *Water treatment, Corrosion inhibition, Test methods, Air Force facilities, Illinois, Cooling towers, Drinking water, Boilers, High temperature, Scale, Corrosion resistance, Industrial engineering.

To develop technology delivery methods, surveys of the water handling facilities at Chanute AFB and Scott AFB were conducted with the purpose of recognizing water-caused problems and presenting means of reducing these problems, particularly corrosion. Recommendations, purchase and installation of necessary water treating and water testing equipment were provided. Water treating chemicals were also purchased for application to reduce scale and corrosion. Base personnel were then trained in water treatment testing and control with the result that water-caused problems in boilers, return condensate, cooling towers and potable water systems were significantly reduced at Chanute AFB. At Scott AFB, the equipment was installed and chemicals supplied; however evaluation of the results were incomplete because equipment was installed at such a late date. Consideration was given to the problems involved in setting up effective water treatment programs at other Air Force bases.

AD-A070 815/6GA PC **A20**/MF **A01**
Transportation Systems Center Cambridge MA
Deployment Requirements for U.S. Coast Guard Pollution Response Equipment. Volume I. Analysis.
Final rept. Oct 77-Jun 78,
J. Bellantoni, J. Garlitz, R. Kodis, A. O'Brien, Jr., and A. Passera. Feb 79, 471p TSC-USCG-79-2-1, USCG-D-14-79-1
See also Volume 2, AD-A070 816 and Rept. no. USCG-WEP-78-2, AD-A067 163 and Rept. no.

USCG-WEP-78-3-SUPPL, AD-A067 076. Supersedes AD-B030 517L.

Descriptors: *Oil spills, *Oil pollution containment, *Water pollution control equipment, Coast Guard, United States, Coastal regions, Site selection, Deployment, Planning, Response, Quick reaction, Optimization, Logistics support, Data bases, Geographical distribution, Threat evaluation, Ocean environments, Environmental protection.

This report presents results of a study to examine the siting and equipment requirements that would have to be met for the U.S. Coast Guard to provide an adequate response within six hours for spills of up to 100,000 tons (28,000,000 gals.) of oil in U.S. waters. A data base of spills over 50,000 gallons in U.S. waters has been compiled from the Pollution Incident Reporting System and National Response Center files of the USCG. Spill rates are derived and applied for the U.S. as a whole and for four major sub-areas. A set of baseline pollution response equipment is adopted, and several equipment site configurations covering the U.S. are evaluated on the basis of six-hour coverage, historic spills encompassed and spill potential. Relative levels of equipment capability for the sites are derived from a simple optimization model. These relative levels are converted to specific equipment requirements on the basis of reasonable forecasts of oil movements in U.S. coastal waters, including oceanic tankers, coastal tank vessels, deepwater ports, and outer continental shelf production. Additional needs of the U.S. Coast Guard are estimated by subtracting the response capacity of equipment available from other response organizations. Worldwide experience of oil spills larger than 1,000,000 gallons is also examined for 1968-1978, and three massive spill scenarios are presented for the U.S. Atlantic and Pacific coasts. Corresponding response scenarios are evaluated, and site locations, equipment levels and logistic requirements are rexamined.

AD-A070 816/4GA PC **A05**/MF **A01**
Transportation Systems Center Cambridge MA
Deployment Requirements for U.S. Coast Guard Pollution Response Equipment. Volume II. Appendixes.
Final rept. Oct 77-Jun 78,
J. Bellantoni, J. Garlitz, R. Kodis, A. O'Brien, Jr., and A. Passera. Feb 79, 85p TSC-USCG-79-2-2, USCG-D-14-79-2
See also Volume 1, AD-A070 815. Supersedes AD-B030 518L.

Descriptors: *Oil spills, *Oil pollution containment, *Water pollution control equipment, Coast Guard, United States, Coastal regions, Site selection, Deployment, Planning, Response, Quick reaction, Optimization, Logistics support, Data bases, Geographical distribution, Threat evaluation, Ocean environments, Environmental protection.

The volume contains 13 technical appendixes dealing with: The Major Oil Spill Information System (data base); Outflow rates from seven massive tanker oil spills; Distribution of US coastal tanker traffic in 1985; Narratives of 17 selected oil spills, 1967-1978; A list of debarkation ports, with figures, in the U.S.; Load/Range tradeoff curves for the USCG HH3-F and C130 aircraft; An analysis of availability of USCG towing vessels; Maps of USCG installations and DOD air bases; The spill potential data base employed in Volume I; A model for distribution of equipment; An analysis of the probabilities of large and simultaneous spills; A list of non-USCG pollution response capabilities; and A brief review of the behavior of surface oil slicks.

AD-A070 818/0GA PC **A04**/MF **A01**
Monsanto Research Corp Dayton OH
Analysis of the Emissions from Storage Tanks during JP-4 Fuel Transfer Operations. Phase II. Cold Weather Conditions.
Final rept.,
W. R. Feairheller. 14 Jun 79, 53p
Contract F41608-78-C-1240
See also AD-A069 339.

Descriptors: Jet engine fuels, Vapors, Transfer, Storage tanks, Cold weather operations, Emission, Sampling, Concentration(Composition), *Air pollution, Chemical analysis, Hydrocarbons.
Identifiers: *JP-4 fuel, *Fugitive emissions.

The objective of this program was to determine the amount of JP-4 vapor emitted to the atmosphere during fuel transfer operations. Emissions from 50,000 gallon underground operating tanks and analyzed by a total hydrocarbon analyzer containing a flame ionization detector.

AD-A070 831/3GA PC **A05**/MF **A01**
Baker (Michael) Jr Inc Beaver PA
National Dam Inspection Program. Little Shenango Dam (NDI PA-00246, PennDER Number 43-54), Ohio River Basin, Calvin Clark Run, Mercer County, Pennsylvania. Phase I Inspection Report.
Apr 79, 92p
Contract DACW31-79-C-0011
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Flooding, Reservoirs.
Identifiers: *Little Shenango Dam, National Dam Inspection Program.

Little Shenango Dam (PA 490) is a homogeneous earth floodwater retarding dam designed by the U.S. Department of Agriculture, Soil Conservation Service. The dam has a crest length of 430 feet, a maximum height of 45 feet, a storage volume of 472 acre-feet at spillway crest level, and a storage volume of 19 acre-feet at normal pool level. The dam was found to be in generally poor condition at the time of inspection. The inspection did disclose potential problems with seepage and piping in the dam embankment and abutments. A detailed engineering investigation of seepage, piping, erosion, and structural stability of the dam should be initiated as expeditiously as possible. Hydraulic/hydrologic evaluations revealed that the spillway will pass the Probable Maximum Flood (PMF) without overtopping the dam. The spillway is therefore considered 'adequate'.

AD-A070 832/1GA PC **A07**/MF **A01**
GAI Consultants Inc Monroeville PA
National Dam Inspection Program. Recreation Dam (NDS ID Number PA-00446, PennDER ID Number 14-26), Susquehanna River Basin, Cold Stream, Centre County, Pennsylvania. Phase I Inspection Report.
Mar 79, 144p
Contract DACW31-79-C-0013

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding.
Identifiers: *Recreation Dam, National Dam Inspection Program.

Recreation Dam is an L-shaped earth dam with a measured maximum height of 14.7 feet and a total length of approximately 1,600 feet. The facility is provided with a masonry spillway at the left abutment along its northern section and a diversion canal along its easterly extension. The latter serves to divert acid mine drainage from upstream mined areas around the facility. Based on visual observations, past history, and a hydrologic and hydraulic investigation, the dam and its appurtenances are considered in poor condition. Based on a visual evaluation and past performance the spillway system is considered structurally unsafe but of non-emergency status as the reservoir is completely drawn down. In addition, evaluation of the flashboard system indicated that failure of the flashboards under normal operating procedures could in itself cause serious downstream consequences.

AD-A070 833/9GA PC **A05**/MF **A01**
Gannett Fleming Corddry and Carpenter Inc Harrisburg PA
National Dam Inspection Program. Carbondale Number 4 Dam (NDI ID Number PA-00384, DER ID Number 35-13), Susquehanna River Basin, Racket Brook, Lackawanna County, Pennsylvania. Phase I Inspection Report.
Feb 79, 83p
Contract DACW31-79-C-0015

Descriptors: *Dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Carbondale Number 4 DAm, National Dam Inspection Program.

Carbondale No. 4 Dam is a masonry dam with earthfill to the top of the dam along the upstream face and earthfill to within 3 to 10 feet of the top of the dam along the downstream face. The dam extends about 580 feet across the valley and is 28 feet high at maximum section. The spillway, an integral part of the masonry dam, is located near the right abutment. It has a rounded crest, and the crest length is 100 feet. Based on visual inspection, available records, calculations and past operational performance, Carbondale No. 4 Dam is judged to be in good condition. The existing spillway can pass 59 percent of the Probable Maximum Flood (PMF) without overtopping of the dam. The spillway capacity is rated as inadequate. A stability analysis performed for this report indicates that the dam is apparently stable for the maximum loading condition.

AD-A070 834/7GA PC **A05**/MF **A01**
Kimball (L Robert) and Associates Ebensburg PA
National Dam Inspection Program. Middle Creek Dam, Clarence F. Walker Lake (NDS ID Number PA-00918, DER ID Number 55-45, SCS ID Number PA-637), Susquehanna River Basin, Middle Creek, Snyder County, Pennsylvania. Phase I Inspection Report.
Apr 79, 97p
Contract DACW31-79-C-0009
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Flooding, Reservoirs, Stability.
Identifiers: *Middle Creek Dam, National Dam Inspection Program.

Middle Creek Dam (Clarence F. Walker Lake) is a zoned earthfill dam. The embankment is 53 feet high and 1360 feet long. The axis of the dam has a 137 deg. bend in the upstream direction 860 feet from the left abutment. The emergency spillway is located on the right (north) abutment. The spillway is 170 feet wide and is open cut in shale and weathered shale. The principal spillway consists of 48 inch concrete pipe with a reinforced concrete riser inlet. Extending upstream of the riser is a 36 inch concrete pipe with a reinforced concrete reservoir drain inlet at the upstream toe of the embankment. At the downstream end of the 48 inch diameter pipe is a concrete impact stilling basin. The embankment and appurtenant structures appear to be in good condition and well maintained. However, the presence of the seepage zones and wet areas are of concern. The long term effect of these areas on the stability of the embankment is unknown. The existing spillways and reservoir are capable of controlling the PMF (probable maximum flood). Based upon criteria established by the Corps of Engineers, the spillway is termed adequate.

AD-A070 835/4GA PC **A04**/MF **A01**
O'Brien and Gere Engineers Inc Philadelphia PA
Justin and Courtney Div
National Dam Inspection Program. Penn Lake Dam (NDI ID Number PA-00542, DER ID Number 40-28), Delaware River Basin, Wright Creek, Luzerne County, Pennsylvania. Phase I Inspection Report.
Mar 79, 70p
Contract DACW31-79-C-0010

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Flooding, Reservoirs, Stability.
Identifiers: *Penn Lake Dam, National Dam Inspection Program.

Penn Lake Dam is an earth embankment approximately 350 feet long and 44 feet high at its maximum section. The spillway consists of twelve 42-inch diameter, 20-foot long pipes located approximately 1,000 feet left (looking downstream) of the dam. Earth swales on both sides of the battery of pipes function as auxiliary spillways. The 56 acre reservoir is used for recreation by members of the Penn Lake Association. Examination of the results of the hydrologic and hydraulic analyses indicates that the spillway (pipes and swales) is capable of passing 48 per cent of the Probable Maximum Flood (PMF) without overtopping of the embankment. Failure of the dam would increase the hazard of loss of life downstream of the dam. The capacity of the spillway system is therefore classified as 'Seriously Inadequate.' The dam is considered to be unsafe (non-emergency). Based on visual observations made during the date of the inspection, the dam is considered to be in poor condition.

AD-A070 836/2GA PC **A04**/MF **A01**
O'Brien and Gere Engineers Inc Philadelphia PA Justin and Courtney Div
National Dam Inspection Program. Bear Creek Lake Dam (NDI ID Number PA-00545, DER ID Number 40-47), Delaware River Basin, Bear Creek, Luzerne County, Pennsylvania. Phase I Inspection Report.
Mar 79, 66p
Contract DACW31-79-C-0010
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Dams, Inspection, Deficiencies, Damage, Flooding, Reservoirs, Pennsylvania, Stability.
Identifiers: *Bear Creek Lake Dam, National Dam Inspection Program.

Bear Creek Lake Dam is a rock filled timber crib structure approximately 325 feet long and 17 feet high at its maximum section. An ungated drop spillway with an 158-foot long sharp crested weir is located approximately 60 feet from the right abutment (looking downstream). The 80 acre lake is used for recreation by the residents of Bear Creek Village. It is unknown when the dam was constructed. In the state inspection report of April, 1915 it is stated, 'This dam was constructed a great many years ago, but it has been repaired from time to time, so that more than likely none of the original structure is now in existence.' Examination of the results of the hydrologic and hydraulic analysis indicate that the drop spillway is capable of passing 11 percent of the Probable Maximum Flood (PMF) without overtopping of the embankment. Failure of the dam would significantly increase the hazard to loss of life downstream of the dam. Therefore, the capacity of the drop spillway is classified as 'seriously inadequate.' The dam is considered to be 'unsafe (non-emergency).'

AD-A070 837/0GA PC **A05**/MF **A01**
O'Brien and Gere Engineers Inc Philadelphia PA Justin and Courtney Div
National Dam Inspection Program. Trout Lake Dam (NDI ID Number PA-00769, DER ID Number 45-43), Delaware River Basin, Appenzell Creek, Monroe County, Pennsylvania. Phase I Inspection Reports.
Mar 79, 82p
Contract DACW31-79-C-0010
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Earth dams, Pennsylvania, Visual inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Trout Lake Dam, National Dam Inspection Program.

Trout Lake Dam is an earth embankment dam with a concrete overflow spillway. The dam is approximately 390 feet long and has a maximum height of about 24 feet. The dam is located along Pennsylvania Route 715, about 1 mile south of Reeders, Pennsylvania. The spillway is capable of discharging 25 percent of the Probable Maximum Flood (PMF) without overtoppong of the earth embankment. Failure of the dam would significantly increase the hazard to loss of life downstream of the dam. Therefore, the spillway is classified as 'seriously inadequate' and the dam is classified as 'unsafe(non-emergency)'. The spillway capacity should be increased. Further detailed hydrologic and hydraulic studies should be performed prior to the design of additional spillway capacity. Based on visual observations and review of the information obtained from the Pennsylvania Department of Environmental Resources, Dam Safety Section, Trout Lake Dam is considered to be in poor condition.

AD-A070 838/8GA PC **A06**/MF **A01**
GAI Consultants Inc Monroeville PA
National Dam Inspection Program. Colyer Lake Dam (NDS ID Number PA-00448, PennDER ID Number 14-112), Susquehanna River Basin, Sinking Creek, Centre County, Pennsylvania. Phase I Inspection Report.
Apr 79, 109p
Contract DACW31-79-C-0013

Descriptors: *Earth dams, Pennsylvania, Inspection, Deficiencies, Damage, Stability, Flooding, Reservoirs.
Identifiers: *Colyer Lake Dam, National Dam Inspection Program.

Colyer Lake Dam is a zoned earth embankment approximately 38 feet high and 700 feet long. Including the spillway system, the length of the facility is approximately 780 feet. The dam is provided with an ungated concrete rectangular spillway and plunge pool located on the right abutment. The spillway consists of a 69-foot wide trapezoidal weir section aside a 10-foot wide rectangular flume section (inside dimensions), separated by a concrete wall. The outlet works consist of a 4-foot square reinforced concrete outlet connected to a rectangular vertical riser. Discharge through the outlet is controlled by stop logs that are set in grooves within the riser. The visual inspection, operational history, and hydroiogic/hydraulic analysis indicate the facility is in good condition. Based on the recommended guidelines, the Spillway Design Flood (SDF) for this facility is the Probable Maximum Flood (PMF). Hydrologic and hydraulic calculations performed for this Phase I study indicate that the discharge/storage capacity of the dam can accommodate a flood of magnitude equal to about 77 percent of the PMF prior to overtopping of the dam. Therefore, the spillway system is considered to be inadequate.

AD-A070 849/5GA PC **A06**/MF **A01**
Army Engineer Div North Pacific Bonneville OR Div Hydraulic Lab
Spillway Modifications for Chief Joseph Dam Columbia River, Washington. Hydraulic Model Investigation.
Final rept. Apr 67-Mar 75.
May 79, 105p Rept no. TR-156-1

Descriptors: *Dams, Modification, *Hydraulic models, Scale models, Head(Fluid mechanics), Water flow, Pressure, Surges, Nitrogen, Entrainment, Rivers, Washington(State).
Identifiers: Chief Joseph Dam, Spillways, Columbia River(Washington).

Spillway modifications were required in plans to increase power production by raising the level of the forebay pool and adding generating units. Pool was to be raised 10 ft initially and later an additional 14 ft. Effect of heads on the crest 1.33 to 1.70 times the design head was studied initially in a 1:42.47-scale model of Lower Granite spillway. Pressures on the spillway were satisfactory with gated flows but indicated cavitation with free flow. Surging occurred in the bays during gated flow. Preliminary studies indicated surging could be controlled by modifications. A modified Chief Joseph spillway with the existing crest, 36-ft-wide bays, and higher gates was studied with heads as high as 1.65 times the design head in a 1:43.35-scale, 4-bay sectional model. In a 1:72-scale comprehensive model of the project, flow conditions with the modified spillway without a flow deflector were satisfactory. The spillway also functioned satisfactorily with a flow deflector when the spill was regulated to avoid surging in the stilling basin. If surging was permitted, high long-period waves along the powerhouse and on the south bank at Foster Creek. Existing riprap on the north bank of the tailrace was adequate with the high head flows.

AD-A070 855/2GA PC **A03**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Proposed Method for Placing Freshly Mixed Concrete in the Deep Ocean.
Final rept. Jun 76-Jun 77,
R. D. Rail, and H. H. Haynes. Jan 79, 49p Rept no. CEL-TN-1544

Descriptors: *Concrete, *Underwater construction, Underwater structures, Ocean bottom, Deep oceans, Pipelines, Cost estimates, Anchors(Structural), Ocean waste disposal, Hazardous materials, Containment(General), Foundations(Structures), Hardened structures.

Potential applications for placing concrete in the deep ocean are basically in three areas: in situ construction of seafloor structures, foundations and massive anchors for fixed ocean facilities, in situ hardening of objects on the seafloor, and containment of hazardous substances for environmental protection. This report presents a method for in situ placememt of fresh concrete on the seafloor in which concrete is mixed on a surface platform and transported to the seafloor via a pipeline suspended from the platform. The proposed development integrates existing technologies of the concrete, oilwell, and marine industries and extends them to new applications in a new environment, and would require a modest development effort as well as simulated tests to verify engineering assumptions based on extrapolation of existing knowledge to the new conditions. The proposed method would greatly extend the Navy's capability to place concrete in the deep ocean for the above applications which would require concrete to be placed underwater in quantities of hundreds and thousands of cubic yards in water depths of many thousands of feet. (Author)

AD-A070 857/8GA PC **A02**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Investigation of Chemical Binders for Beach Sand.
Final rept. Oct 76-Jun 78,
Thorndyke Roe, Jr., Sylvio Tuccillo, and Richard Lorenzana. Feb 79, 25p Rept no. CEL-TN-1546

Descriptors: *Binders, *Sand, *Trafficability, Roads, Amphibious vehicles, Amphibious operations, Sea water, Penetration, Soil mechanics, Soils, Isocyanates, Polymers, Costs.
Identifiers: *Soil stabilization.

An additive was sought for seawater such that the mixture could be sprayed on beach sand to make a trafficable crust for amphibious warfare operations. None met all requirements, but a proprietary polysiocyanate met most. It could not be premixed with seawater, but it penetrated seawater-wet sand and produced a 6-inch-thick crust of 100 psi compressive strength in one hour at a cost of $6 to $10 for materials per square foot of sand stabilized. (Author)

AD-A070 864/4GA PC **A04**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Long-Term, Deep-Ocean Test Concrete Spherical Stuctures - Results Ater 6 Years.
Final rept. Jul 71-Mar 78,
Harvey H. Haynes, and Roy S. Highberg. Jan 79, 53p Rept no. CEL-TR-869

Descriptors: *Underwater structures, *Concrete, Shells(Structural forms), Spheres, Deep oceans, Sea testing, Hydrostatic pressure, Strength(Mechanics), Compressive properties, Permeability, Loads(Forces), Long range(Time), Protective coatings, Waterproofing, Walls, Saturation, Implosions, Structural engineering, Marine engineering, Performance(Engineering).
Identifiers: Durability, Unreinforced concrete.

In 1971, a long-term, deep-ocean test was started on eighteen concrete spheres, 66 inches (1, 676 mm) in outside diameter by 4,12 inches (105 mm) in wall thickness. The spheres were placed in the ocean at depths from 1,840 to 5,075 feet (560 to 1,547 m). Over a 6.4-year period, yearly inspections of the spheres by submersibles have provided data on time-depedent failure and permeability. After 5.3 years, three of the spheres were retrieved from the ocean for laboratory testing. Data on concrete compressive strength gain, short-term implosion strength of the three retrieved spheres, and permeability and durability of the concrete were obtained. This report summarizes the findings from the laboratory and ocean tests. (Author)

AD-A070 865/1GA PC **A04**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
CEL Building and Experimental Subgrade Cooling System, Barrow, Alaska - Construction History and Performance Characteristics.
Final rept. Sep 75-Sep 78,
J. L. Barthelemy. Apr 79, 61p Rept no. CEL-TR-870

Descriptors: *Permafrost, *Foundations(Structures), Liquid cooling, Convection(Heat transfer), Heat exchangers, Construction, Cold regions, Structural engineering, Gravel, Buildings, Soils, Thawing, Control, Alaska.
Identifiers: Subgrades, *Cold weather construction.

Gravel requirements for structures placed on unstable permafrost can be reduced by incorporating various insulation materials into the floor and foundation systems. However, to reduce the need for

gravel even more, some means of extracting heat from the ground beneath the structure must be provided. During the summer of 1976, personnel from the Civil Enginnering Laboratory erected a building on the ice-rich permafrost near Barrow, Alaska. The structure, placed on just 1 foot of gravel, has been used as a test bed to evaluate an experimental subgrade cooling system. The cooling system consists of 15 loop-configured heat exchangers called convection cells. During the winter months, heat losses from the building into the permafrost are redirected via these convection cells to the cold environment outside, thus preventing progressive degradation from thaw. To date, data collected from some 150 thermocouples located in the subgrade and heat-exchange systems have shown that the rate of winter heat removal is even greater than originally anticipated. Although a small cyclical displacement of the floor and foundation resulting from seasonal summer thaw and winter freezeback has been apparent, this movement is minimal compared to settlement which would have occurred had the massive ice present in the subgrade been allowed to thaw unchecked. (Author)

AD-A070 869/3GA PC **A06**/MF **A01**
Southern Illinois Univ at Carbondale Dept of Geography
The Role of Conservation in Water Supply Planning.
Final rept.,
Duane D. Baumann, John J. Boland, John H. Sims, Bonnie Kranzer, and Philip H. Carver. Apr 79, 125p IWR-CR-79-2
Contract DACW72-78-C-0022

Descriptors: *Water conservation, Planning, Resource management, Water resources.
Identifiers: *Water supply, Requirements, Assessments.

The report has formulated a definition of water conservation, assessed the adequacy of knowledge on the available conservation measures, and identified the requirements and needs for implementation. (Author)

AD-A070 870/1GA PC **A09**/MF **A01**
Planning and Management Consultants Ltd Carbondale IL
An Annotated Bibliography on Water Conservation.
Final rept.,
Duane D. Baumann, Kurt Alley, John Boland, Phillip Carver, and Bonnie Kranzer. Apr 79, 188p IWR-CR-79-3
Contract DACW72-78-M-0752

Descriptors: *Bibliographies, *Water conservation, Resource management, Water resources, *Water supplies, Surveys.

The report is based on a review of both published and unpublished conservation literature providing an annotated description of each, including reference. (Author)

AD-A070 908/9GA PC **A04**/MF **A01**
Culp/Wesner/Culp El Dorado Hills CA
Development Plan For Military Water Quality Criteria for Specific Wastewater Reuse Applications.
Final rept. 1 Apr-15 Nov 78,
Russell L. Culp. Jun 79, 58p
Contract DAMD17-78-C-8029

Descriptors: Water quality, Quality assurance, Standards, Toxicity, Military requirements, Field conditions.
Identifiers: *Waste water reuse, *Water pollution, Standards, Numerical analysis, Water treatment, *Water quality criteria.

This report presents plans which are to be used in a subsequent effort to develop detailed quality criteria for waters derived from wastewaters. The U.S. armed forces are contemplating the reuse of renovated wastewaters for specific military purposes including short-term (1 to 7 days) non-potable reuse in the field and long-term (more than 7 days) non-potable and potable reuse at fixed installations. The study proposes the use of conventional numerical standards or maximum contaminant limits wherever possible. However, there may be instances where it is advantageous to specify a certain treatment process to remove a given contaminant or group of contaminants. In these cases, consideration will be given to use of unconventional standards or treatment standards. The primary purpose of this study is to point the way to development of the required reuse criteria as rapidly and efficiently as possible. (Author)

AD-A070 938/6GA PC **A05**/MF **A01**
North Texas State Univ Denton Inst of Applied Science
Ecological Parameters Pertinent to Development of a Water Quality Assessment Model for Clover Creek McChord Air Force Base, Washington.
Lloyd C. Fitzpatrick, and John L. Hughes. 21 Sep 78, 82p AFOSR-79-0821
Grant AFOSR-77-3309

Descriptors: Streams, *Ecology, Air Force facilities, Ecosystems, Mathematical models, Animals, Plants(Botany), Communities.
Identifiers: *Clover Creek, McChord Air Force Base, *Water pollution, Planning, Environmental impacts, Watersheds, Baseline data, *Water quality data.

This model should be able to predict and assess impacts and offer mitigative strategies for sound environmental planning of Air Force operations that could impact aquatic ecosystems. Development of an effective instrument requires much more than systems analysis and computer modeling technology. It requires working knowledge of structure and dynamics of aquatic ecosystems and their watersheds, and adequate data bases for specific systems. Biological subsystems within ecosystems are considerably more complex and difficult to model than physical dynamics (e.g., hydrological. Air Force personnel involved in water quality assessment model development should have an understanding of the structure and dynamics of aquatic ecosystems and their watersheds. Because aquatic systems vary considerably among eco-geographical regions, they should be cognizant of specific baseline data required to develop models of lentic and lotic dynamics.

AD-A071 041/8GA PC **A04**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Improved Drainage and Frost Action Criteria for New Jersey Pavement Design. Phase II. Data Analysis.
Special rept.,
Richard L. Berg. May 79, 58p Rept no. CRREL-SR-79-15
See also AD-A055 785.

Descriptors: *Pavements, *Frost, *Drainage, Layers, Penetration, Depth, Construction materials, Thermal properties, Moisture, Soils, New Jersey.
Identifiers: *Open graded drainage layers, *Frost penetration.

The feasibility of including open-graded drainage layers in their highway pavements was studied. Before constructing actual pavements with open-graded drainage layers, frost penetration depths and moisture content profiles beneath several pavements in New Jersey were measured. Air and surface freezing indexes were measured at three locations during the 1975-1976 and 1976-1977 winters. Measured maximum frost penetration depths were compared with computed maximum depths for each of 30 test sites. The modified Berggren equation was used to compute the maximum frost depth at each site. Maximum frost penetration depths were computed for hypothetical pavements with open-graded drainage at four of the test sites. It was concluded that open-graded drainage layers would not significantly change the frost penetration beneath highway pavements in New Jersey. It was recommended that test pavements be installed to verify the computations.

AD-A071 046/7GA PC **A08**/MF **A01**
Texas A and M Research Foundation College Station
Fate of Oil Spilled from the Supertanker METULA.
Final rept.,
Roy W. Hann, Jr., and Harry N. Young, Jr. Jan 79, 166p USCG-WEP-2-79
Contract DOT-CG-62281-A

Descriptors: Oil spills, *Oil pollution, Environmental protection, Chile, Ocean environments, Oceanographic data, Marine biology, Ecosystems, Crude oil, *Coastal regions, Disasters, Waterfowl.
Identifiers: *Magellan Straits, Supertankers, *Metula vessel, Tanker ships, Windward drift, Education, International relations, Tierra del Fluego Island, Volume, Lessons learned.

On 9 August 1974, the METULA, a 206,000 deadweight VLCC (Very Large Crude Carrier) enroute from Ras Tenura, Saudi Arabia to Quintera Bay, Chile, with a load of 195,673 tons of Arabia light crude, ran aground on the Satellite Patch Shoal in the Straits of Magellan, Chile. The oil spill was destined to become the world's second largest as of that time, exceeded only by the famous TORREY CANYON disaster. In terms of oil deposited on the shore, the METULA spill may be the world's largest, since the geography of the area, the prevailing winds, and the nearness of the grounded ship to shore caused most of the oil to reach the Chilean shoreline primarily on the shore of the famous Island of Tierra del Fuego, which forms the southern shore of the eastern half of the Straits. The greatest significance of this spill results from the fact that no cleanup operation was attempted and thus the spill became by default, the world's largest scientific oil spill. This report describes the oceanographic and meteorological setting of the grounding and subsequent spill and discusses the grounding, the resulting spill and the deposition of the oil on shore. An in-depth discussion of fifteen selected sites is presented including environmental features, the deposited oil and its appearance and behavior at different times and the visual impact of the spill. The final section of this report addresses the lessons learned at the time of the spill and subsequently and discusses the development of pilot international training efforts to help countries plan to deal with such spills. (Author)

AD-A071 061/6GA MF **A01**
New York State Dept of Environmental Conservation Albany
National Dam Safety Program. Grassy Sprain Reservoir (NY 188), Lower Hudson River Basin, Grassy Sprain Brook, Westchester County, New York. Phase I Inspection Report. Addendum.
2 May 79, 61p
Contract DACW51-78-C-0035
Addendum to AD-A064 084. Prepared in cooperation with Dale Engineering Co., Utica, NY.
Availability: Microfiche copies only.

Descriptors: *Dams, *Inspection, *Structural analysis, Safety, New York, Geology, Reservoirs, Seismic data, Seepage.
Identifiers: National Dam Safety Program, *Grassy Sprain Reservoir Dam, Spillways.

No abstract available.

AD-A071 077/2GA PC **A03**/MF **A01**
Wisconsin Univ-Madison Coll of Agriculture and Life Sciences
Evaluation of Nitrification Inhibitors in Cold Regions Land Treatment of Wastewater. Part 1. Nitrapyrin.
Special rept.,
S. M. Elgawhary, I. K. Iskandar, and B. J. Blake. May 79, 30p CRREL-SR-79-18-PT-1
Grant DACA89-78-G-001

Descriptors: *Waste water, *Waste treatment, Environmental protection, Cold weather tests, Army Corps of Engineers, Data acquisition, Soil tests, Pollutants.
Identifiers: *Denitrification, Nitrapyrin, *Land disposal, *Pryidine/chloro-(trichloromethyl), *Water pollution control.

A series of laboratory and field tests were conducted to investigate the possibility that nitrapyrin could be useful as a nitrification inhibitor in land treatment of wastewater. Laboratory tests included soil incubation and soil column studies. Variables were soil type, temperature, nitrapyrin concentration and method of application to the soil. Experimental designs included two soils, three temperatures (0, 10 and 20 C) and three levels of inhibitors in a complete factorial. Forage grasses were present in all treatments, and wastewater

containing NH4+ was utilized. Weekly application of wastewater was 5 cm. Soil solution at depth and leachate at 160 cm were collected and analyzed weekly for NH4-N and NO3-N. That data indicate that nitrapyrin was not effective in inhibiting nitrification when applied to the soil surface in soil columns simulating land treatment slow infiltration. The ineffectiveness of the compound under a mode of application where it is mixed and sprayed with wastewater is thought to be due to its volatility, sorption by organic matter, low water solubility and its immobility in soils. Other chemicals such as carbon disulfide and thiocarbonates, which have different characteristics than the nitrapyrin, showed promising results. Research is under way to obtain conclusive data. (Author)

AD-A071 111/9GA PC **A20**/MF **A01**
Department of the Air Force Washington DC
Environmental Impact Analysis Process. Environmental Impact Statement, AWACS Beddown at Tinker AFB, Oklahoma.
Final rept.
Dec 76, 451p

Descriptors: *Electronic aircraft, *Environmental impact statements, Urban areas, Oklahoma, Air Force facilities, Airports, Air traffic, Land use, Impact.
Identifiers: Airborne Warning and Control Systems, Tinker Air Force Base, Oklahoma City(Oklahoma), *Noise pollution, *Air pollution, *Environmental impact statements-draft.

The principal impacts associated with the beddown are related to the operational characteristics of the E-3A aircraft in terms of noise and engine emissions. Noise from aircraft operations by 1981 may contribute to an additional 549 acres of incompatible land use. An additional 7,234 inhabitants and 2,042 housing units may be located in areas around Tinker AFB considered incompatible according to AICUZ criteria. The increase in air pollutant emissions by 1981 resulting from AWACS will be equivalent to approximately 0.5 percent or less of the regional emissions reported for 1970. Increases impede, to some degree, efforts to control concentrations of these pollutants which are already exceeding standards established for the region.

AD-A071 132/5GA PC **A03**/MF **A01**
Army Engineer Waterways Experiment Station Vicksburg MS
The Corps of Engineers Dredged Material Research Program.
Miscellaneous paper,
R. L. Montgomery, and F. H. Griffis, Jr. Dec 73, 45p Rept no. WES-MP-D-73-8
Presented at the Annual World Dredging Conference (5th) in Hamburg, Germany, F.R, June 1973. See also Rept. no. WES-TR-H-72-8. Report on The Corps of Engineers Dredged Material Research Program.

Descriptors: *Sediments, Turbidity, Army Corps of Engineers, Dredging, Land use, Earth fills.
Identifiers: Spoil, *Dredge spoil, *Solid waste disposal, Maintenance, Research projects, Assessment, Ocean waste disposa, Land application, Marshes, Land disposal.

The Corps of Engineers, in fulfilling its mission in the development and maintenance of the navigable waters of the United States, is responsible for the dredging of large volumes of sediment each year. Annual quantities approach 400,000,000 cu yd of dredged material each year for both maintenance and new work dredging, with costs exceeding $150 million. In recent years, concern has been expressed about these operations from a number of viewpoints including fish and wildlife considerations, effects on water quality, and land use impacts. Because of these concerns, the necessity to establish regulatory criteria, and the lack of definitive information on many important questions, the Corps was authorized by Congress in the 1970 River and Harbor Act to initiate a comprehensive study relating to the disposal of dredged material. The study was divided into four phases: (1) problem identification and assessment, (2) development of a research program, (3) accomplishment of the needed research, and (4) field evaluation of new or improved disposal practices. This paper summarizes the results of Phases I and II, the problem identification and assessment, and the development of the research program. It describes specific conclusions reached in problem definition relative to open water disposal, land disposal, and marsh disposal.

AD-A071 160/6GA PC **A13**/MF **A01**
Infantry Div (7th) Fort Ord CA
Ground Squirrel Control, Fort Ord Complex Fort Ord, California.
Draft environmental impact statement,
Charles L. McNeill. 1 Feb 77, 290p
See also report dated Apr 77, AD-A071 161.

Descriptors: *Squirrels, *Pest control, Military facilities, Toxic agents, Insecticides, Biological pest control, Toxicity, Vegetation, Requirements, Land use, Surveys, Rodenticides, *California.
Identifiers: *Ground squirrels, Public health, Regulations, Citellus, Damage, Monterey County(California), San Luis Obispo County(Calfiifornia), Effectiveness, *Environmental impact statements-draft.

It is proposed to significantly reduce ground squirrel populations occupying large areas of grassland and woodland-grassland upon Fort Ord, Fort Hunter Liggett and Camp Roberts located in the counties of Monterey and San Luis Obispo in the central coastal area of California. Significant ground squirrel control formerly in effect upon these areas was last applied in 1971, and has not been resumed since Executive Order no.18870 prohibited the use of secondary poisons for pest control upon federal lands. Present ground squirrel control measures are limited to anticoagulants and zinc phosphide applied only within 200 yards of occupied structures. Large-scale ground squirrel control measures using 1080 (a secondary poison) have been used on private lands adjacent to the military lands for many years, but squirrels from the military lands are claimed to reinfest the treated private lands, causing crop damage and rendering the ground squirrel control program on private lands ineffective.

AD-A071 161/4GA PC **A19**/MF **A01**
Infantry Div (7th) Fort Ord CA
Ground Squirrel Control, Fort Ord Complex Fort Ord, California.
Final environmental impact statement,
Charles L. McNeill. Apr 77, 428p
See also report dated Feb 77, AD-A071 160. Errata sheets inserted.

Descriptors: *Squirrels, *Pest control, Military facilities, Insecticides, Biological pest control, California, Pesticides, Requirements, Land use, Damage, Rodenticides, Costs.
Identifiers: *Ground squirrels, Pubic health, *Citellus, Zinc inorganis compounds, *Environmental impact statements-final, Monterey County(California), San Luis Obispo County(California), Effectiveness.

It is proposed to significantly reduce ground squirrel populations occupying large areas of grassland and woodland-grassland upon Fort Ord, Fort Hunter Liggett and Camp Roberts located in the Counties of Monterey and San Luis Obispo in the central coastal area of California. Ground squirrel control (using 1080, formerly in effect upon these areas, was last applied in 1970 and has not been resumed since Executive Orders No. 11643 and No. 11870 prohibited the use of secondary poisons for pest control upon federal lands. Present ground squirrel control measures are limited to anticoagulants and zinc phosphide applied only within 200 yards of occupied structures. large-scale ground squirrel control measures using 1080 (a poison which has potential secondary hazards) have been used on private lands adjacent to the military lands for many years, but squirrels from the military lands are claimed to reinfest the treated private lands, causing crop damage and rendering the ground squirrel control program on private lands ineffective.

AED-CONF-77-564-001 PC **A02**/MF **A01**
Essen Univ. (Gesamthochschule) (Germany, F.R.).
Possibilities to Design Non-Polluting Coal-Fired Power Plants.
T. J. Bohn. 1977, 19p CONF-7711102-3
In German.Conference on possibilities of designing coal energy production facilities not harmful to the environment and gas purification in connection with thermal power stations, Essen, F.R. Germany, 17 Nov 1977.
U.S. Sales Only.

Descriptors: *Fossil-fuel power plants, *German federal republic, Bituminous coal, Energy supplies.
Identifiers: ERDA/200202, ERDA/320603, West Germany, Electric power plants, Design criteria, *Air pollution control.

For abstract, see ERA citation 04:042851.

CONF-790305-8 PC **A02**/MF **A01**
Argonne National Lab., IL.
Removal of Gaseous Alkali Metal Compounds from Hot Flue Gas by Particulate Sorbents.
S. H. D. Lee, and I. Johnson. 1979, 25p
Contract W-31-109-ENG-38
ASME gas turbine closed-cycle session, San Diego, CA, USA, 11 Mar 1979.

Descriptors: *Alkali metal compounds, *Bauxite, *Diatomaceous earth, *Flue gas, *Fluidized-bed combustors, *Gas turbines, Chlorides, Coal, Combined-cycle power plants, Corrosion, Corrosive effects, Fluidized-bed combustion, Granular bed filters, Purification, Removal, Sorptive properties, Sulfates.
Identifiers: ERDA/010800, *Air pollution control, Combustion products, Industrial wastes.

For abstract, see ERA citation 04:040130.

COO-1248-55 PC **A11**/MF **A01**
Minnesota Univ., Minneapolis. Particle Technology Lab.
Aerodynamic Particle Size Measurement by Laser--Doppler Velocimetry. Publication Number 343.
J. C. Wilson. Dec 77, 230p
Contract EY-76-S-02-1248
Thesis.

Descriptors: *Aerosols, *Particle size, *Particles, Aerodynamics, *Air pollution, Doppler effect, Experimental data, Graphs, Isolated values, Lasers, Measuring methods, Nozzles, Theoretical data, Velocimeters.
Identifiers: ERDA/300200, Laser doppler velocimeters.

For abstract, see ERA citation 04:041127.

COO-2874-41 PC **A02**/MF **A01**
Stanford Univ., CA. Dept. of Statistics.
Some Problems of Validation and Testing of Numerical Air Pollution Models. Technical Report No. 21.
P. Switzer, and P. Zannetti. Sep 78, 18p
Contract EY-76-S-02-2874

Descriptors: *Air pollution, *Carbon monoxide, Evaluation, Forecasting, *Mathematical models, Missouri, Monitoring.
Identifiers: ERDA/500200.

For abstract, see ERA citation 04:043726.

COO-4546-13 PC **A02**/MF **A01**
Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
Treatment of Meat Processing Wastewater. Non-Equilibrium Carrier Effects on Solar Cell Performance.
B. F. Miller, and D. K. Ferry. Oct 78, 7p
Contract EG-77-S-02-4546

Descriptors: *Meat industry, *Waste water, Chemical oxygen demand, Food processing, Solar heating.
Identifiers: ERDA/140905, ERDA/140501, *Water pollution.

For abstract, see ERA citation 04:044614.

DOE/EIS-0038 PC **A25**/MF **A01**
Department of Energy, Washington, DC. Economic Regulatory Administration.
Fuel Use Act. Final Environmental Impact Statement.
Apr 79, 589p
Microfiche copies only.

Descriptors: *Environmental impact statements-final, *Fuel Use Act, Air quality, Fossil-fuel power plants, Fuel substitution, Land use, Regional anal-

ysis, Transportation sector, Water quality, Water resources.
Identifiers: ERDA/293000, ERDA/200108, ERDA/530300, ERDA/290300.

For abstract, see ERA citation 04:044913.

FE-1536-T3 PC **A03**/MF **A01**
Combustion Power Co., Inc., Menlo Park, CA.
Energy Conversion from Coal Utilizing CPU-400 Technology. Research and Development Report No. 94. Quarterly Report No. 2, October--December 1974.
Feb 75, 37p
Contract EX-76-C-01-1536

Descriptors: *Coal, *Cpu-400 combustion plant, *Turbine blades, Calcination, Chemical reactions, Combustion, Corrosion, Cyclone separators, Deposition, Dolomite, Erosion, Fluidized-bed combustion, Gas turbines, Granular bed filters, Hot gas cleanup, Nitrogen oxides, Particles, Performance testing, Removal, Service life, Sulfidation, Sulfur dioxide.
Identifiers: ERDA/014000, ERDA/010900, *Air pollution control, Industrial wastes, Combustion products.

For abstract, see ERA citation 04:044269.

FE-2240-50 PC **A04**/MF **A01**
Braun (C.F.) and Co., Alhambra, CA.
Sulfur Recovery in a Coal Gasification Plant.
W. S. Chia, and F. A. Todd. Aug 78, 66p
Contract EX-76-C-01-2240

Descriptors: *Bi-gas process, *Coal gasification plants, *Sulfur, Beavon process, By-products, Carbon dioxide acceptor process, Claus process, Comparative evaluations, Flue gas, FMC double alkali process, HYGAS process, Lurgi process, Recovery, Selexol process, Stretford process.
Identifiers: ERDA/010800, ERDA/010404, *Air pollution control, Design criteria, Performance evaluation, Industrial wastes, Combustion products, Waste recycling, Economic analysis.

For abstract, see ERA citation 04:044247.

FE-2495-T13 PC **A11**/MF **A01**
Dalton-Dalton-Little-Newport, Inc., Cleveland, OH.
Test of the Draft Guidelines for Multimedia Environmental Monitoring of Department of Energy Fossil Energy RD and D Facilities.
R. G. Rolan. Dec 78, 229p
Contract EX-76-C-01-2495

Descriptors: *Coal gasification plants, *Energy facilities, *Air pollution, Carbon dioxide acceptor process, Elements, Environmental impacts, *Monitoring, Planning, Sampling, Trace amounts, X-ray fluorescence analysis.
Identifiers: ERDA/010900, ERDA/010404, ERDA/500200, ERDA/520200, *Guidelines.

For abstract, see ERA citation 04:042233.

FE-2496-11 PC **A03**/MF **A01**
Carnegie-Mellon Univ., Pittsburgh, PA. Environmental Studies Inst.
Wastewater Analysis in the ERDA Coal Gasification Environmental Assessment Program. Third Quarterly Report.
R. G. Luthy, M. J. Massey, and R. W. Dunlap.
Apr 77, 32p
Contract EX-76-S-01-2496

Descriptors: *Coal gasification plants, *Waste water, Carbon dioxide acceptor process, Chemical analysis, High btu gas, Hygas process, Sampling, Streams.
Identifiers: ERDA/010404, ERDA/010900, ERDA/010800, *Water pollution detection, *Water analysis.

For abstract, see ERA citation 04:028739.

KFK-PDV-160 PC **A06**/MF **A01**
Kernforschungszentrum Karlsruhe G.m.b.H. (Germany, F.R.).
System Development for Optimizing Electric Power Supply Equipment.
J. ..Dobberstein, and A. Petroianu. Sep 78, 121p In German.
U.S. Sales Only.

Descriptors: *Load management, *Power systems, Electric utilities, On-line control systems, Optimization, Power generation, Power transmission.
Identifiers: ERDA/200100, ERDA/200300, ERDA/296000, West Germany, *Load control, Electric power distribution, Computer applications.

For abstract, see ERA citation 04:042830.

LA-7795-MS PC **A06**/MF **A01**
Los Alamos Scientific Lab., NM.
Experimental Design and Data of the April 1977 Multitracer Atmospheric Experiment at the Idaho National Engineering Laboratory.
W. E. Clements. May 79, 101p
Contract W-7405-ENG-36

Descriptors: *Air samplers, *Chemical effluents, *Environmental transport, *Radioactive effluents, Aerial monitoring, Air pollution, Carbon 13, Cycloalkanes, Data compilation, Deuterium compounds, Earth atmosphere, Experimental data, Idaho national engineering laboratory, Isolated values, Methane, Organic fluorine compounds, Performance testing, Sampling, Simulation, Sulfur fluorides, Tables, Tracer techniques.
Identifiers: ERDA/500100, ERDA/500200, ERDA/500300, ERDA/500500.

For abstract, see ERA citation 04:043720.

METC/CR-79/23 PC **A06**/MF **A01**
West Virginia Univ., Morgantown. Dept. of Chemical Engineering.
Sour Water Stripping of Coal Gasification Waste Water.
F. H. Verhoff, and M. K. Choi. May 79, 108p

Descriptors: *Coal gasification plants, *Waste water, Ammonia, Carbon dioxide, Equilibrium, Gas chromatography, Hydrogen sulfides, *Mathematical models, Organic compounds, Separation processes, Waste disposal, Waste processing.
Identifiers: ERDA/010404, Substitutes, *Inorganic compounds, Chemical equilibrium, *Water pollution control.

For abstract, see ERA citation 04:044215.

NLCO-1159 PC **A03**/MF **A01**
National Lead Co. of Ohio, Cincinnati.
Feed Materials Production Center Environmental Monitoring Annual Report for 1978.
M. W. Boback, and K. N. Ross. 1 May 79, 37p
Contract EY-76-C-05-1156

Descriptors: *Air quality, *Feed materials production center, *Water quality, Aerosol monitoring, Fluorides, Human populations, Hydrogen ions, Monitoring, Nitrates, Radiation doses, Radiation monitoring, Rivers, Sediments, Sewage, Soils, Thorium, Uranium.
Identifiers: ERDA/500200, ERDA/500300, ERDA/510200, ERDA/520200, ERDA/520300, *Radioactive contaminants.

For abstract, see ERA citation 04:045339.

NTIS/PS-79/0878/3GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Airport Noise (A Bibliography with Abstracts).
Rept. for 1964-Jul 79,
Guy E. Habercom. Sep 79, 271p*
Supersedes NTIS/PS-78/0807, NTIS/PS-77/0704, NTIS/PS-76/0625, and NTIS/PS-75/530.

Descriptors: *Bibliographies, *Airports, *Aircraft noise, *Noise pollution, Noise exposure, Noise abatement, Noise reduction, Physiological effects, Urban planning, Air traffic, Abstracts.
Identifiers: *Noise levels, *Preferential runway systems.

Aircraft created noise, noise intensity, noise exposure, and physiological effects, all in airport environments, are investigated in these research reports. (This updated bibliography contains 265 abstracts, 19 of which are new entries to the previous edition.)

NTIS/PS-79/0886/6GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Taxicab Transportation (A Bibliography with Abstracts).
Rept. for 1964-Jul 79,
Edith Kenton. Sep 79, 71p*
Supersedes NTIS/PS-78/0452.

Descriptors: *Bibliographies, *Urban transportation, *Automobiles, Services, Industrial relations, Coordination, Centralized control, Transportation management, Vehicles, Scheduling, Passenger transportation, Common carriers, Travel demand, User needs, Marketing, Economic factors, Operations research, Policies, Regulations, Rates(Costs), Licenses, Statutes, Ordinances, Elderly persons, Handicapped persons.
Identifiers: *Taxicabs, Shared ride taxi systems, Paratransit, Transportation planning, Demand responsive transportation systems, Trip sharing, Public transportation, Automatic vehicle monitoring, Automatic vehicle location systems, Fare structures, Taxicab industry, Taxicab drivers.

The role of taxicab services as another means of public transportation is cited including services of large taxicab vehicles, multi-origin destination taxi systems responding on demand, and shared ride taxi systems. Vehicle monitoring systems for centralized management to provide location for fleet vehicles are described as are user characteristics and taxi traffic in urban areas. Regulations and ordinances, policies, operating and economic characteristics of the urban taxicab industry including fare structure, computer applicattions and market studies are covered. (This updated bibliography contains 65 abstracts, 14 of which are new entries to the previous edition.)

NTIS/PS-79/0900/5GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tunnel Con struction. Volume 2. 1977-July, 1979 (Citations from the NTIS Data Base).
Rept. for 1977-Jul 79,
Guy E. Habercom, Jr. Sep 79, 142p*
Supersedes NTIS/PS-78/0848, NTIS/PS-77/0787, NTIS/PS-76/0647, NTIS/PS-75/550, and NTIS/PS-74/096. For the companion Published Searches of the Engineering Index Data Base, see NTIS/PS-76/0648, NTIS/PS-76/0649, NTIS/PS-76/0650, NTIS/PS-78/0849, NTIS/PS-79/0901, and NTIS/PS-79/0902. See also Volume 1, 1964-1976, NTIS/PS-78/0847.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these Government-sponsored research reports. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (This updated bibliography contains 134 abstracts, 37 of which are new entries to the previous edition.)

NTIS/PS-79/0901/3GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tunnel Construction. Volume 5. September, 1977-July, 1978 (Citations from the Engineering Index Data Base).
Rept. for Sep 77-Jul 78,
Guy E. Habercom, Jr. Sep 79, 181p*
For the companion Published Searches of the NTIS Data Base, see NTIS/PS-78/0847 and NTIS/PS-79/0900. See also Volume 1, NTIS/PS-76/0648, Volume 2, NTIS/PS-76/0649, Volume 3, NTIS/PS-76/0650, and Volume 4, NTIS/PS-78/0849.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock me-

chanics. (This updated bibliography contains 175 abstracts, none of which are new entries to the previous edition.)

NTIS/PS-79/0902/1GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Tunnel Construction. Volume 6. August, 1978-July, 1979 (Citations from the Engineering Index Data Base).
Rept. for Aug 78-Jul 79,
Guy E. Habercom, Jr. Sep 79, 143p*
Supersedes NTIS/PS-78/0850, NTIS/PS-77/0788 and NTIS/PS-76/0651. For the companion Published Searches of the NTIS Data Base, see NTIS/PS-78/0847 and NTIS/PS-79/0900. See also Volume 1, NTIS/PS-76/0648, Volume 2, NTIS/PS-76/0649, Volume 3, NTIS/PS-76/0650, Volume 4, NTIS/PS-78/0849, Volume 5, NTIS/PS-79/0901.

Descriptors: *Bibliographies, *Tunnel construction, *Tunneling(Excavation), Tunneling machines, Tunnel linings, Cost analysis, Rock properties, Underground supporting, Finite element analysis, Abstracts.
Identifiers: *Tunnel supports.

Unique tunneling methods, cost studies, tunnel support innovations, tunneling machines, and soil and rock properties encountered are investigated in these reports gathered in a worldwide literature survey. Vehicular, water, sewage, and mine tunnels are reviewed. Finite element analysis is used extensively for investigation of soil and rock mechanics. (This updated bibliography contains 137 abstracts, all of which are new entries to the previous edition.)

NTIS/PS-79/0917/9GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Noise Pollution Economics (A Bibliography with Abstracts).
Rept. for 1964-Jul 79,
Diane M. Cavagnaro. Sep 79, 125p*
Supersedes NTIS/PS-78/0851, NTIS/PS-77/0789, NTIS/PS-76/0662, NTIS/PS-75/534, and NTIS/PS-74/093.

Descriptors: *Noise pollution, *Economic analysis, *Bibliographies, Noise reduction, Transportation, Turbomachinery, Nacelles, Metal industry, Urban areas, Government policies, Planning, Management, Abstracts.

The economic factors of noise pollution control and management are presented for industry, urban areas, Government planning, and transportation. The majority of reports cover the economic impact of controlling aircraft noise or the impact of motor vehicle noise on society. (This updated bibliography contains 119 abstracts, 14 of which are new entries to the previous edition.)

NUREG/CR-0771 PC **A05**/MF **A01**
Naval Research Lab., Washington, DC.
Effects of Weathering on Impregnated Charcoal Performance.
Memorandum rept.,
Victor R. Deitz. 10 May 79, 80p NRL-MR-4006
See also AD-A069 499.

Descriptors: *Air pollution, *Degradation, *Weathering, Charcoal, Impregnating, Adsorbents, Nuclear power plants, Ventilation, Exposures, Temperature, Humidity, Hydrocarbons, Water vapor, Moisture.
Identifiers: *Activated charcoal, Indoor air pollution, Iodide/methyl.

The useful life of activated carbon filters in engineered-safety-feature and normal ventilation systems of nuclear power stations is slowly impaired by the contaminants accumulated from the large volume of air being processed. The weathering of eight commercial impregnated activated carbons have now been studied by a two-fold approach: (1) Exposure to unmodified outdoor air for periods up to nine months, followed by measurements of methyl iodide-131 penetration, and (2) exposure of the same type charcoals to air flows of known pollutant species and concentrations under controlled laboratory conditions, also followed by measurements of the methyl iodide-131 penetration. There is evidence from both the laboratory and outdoor exposure tests that moisture can enhance charcoal degradation. It is believed that local meteorological conditions of high humidity combined with atmospheric pollutants in the test vicinity contribute jointly to the degradation of impregnated activated carbons.

NUREG/CR-0894 PC **A06**/MF **A01**
New York State Energy Research and Development Authority, New York.
Power Plant Entrainment Simulation Utilizing a Condenser Tube Simulator.
Annual rept. 1 Dec 77-30 Nov 78,
J. M. O'Connor, and G. V. Poje. Jul 79, 119p
Contract NRC-04-78-211
Prepared by New York Univ. Medical Center, NY.

Descriptors: *Electric power plants, *Entrainment, *Bass, *Condenser tubes, *Hudson River Estuary, Simulation, Eggs, Larvae, Stresses, Temperature measurement, Pressure, Chlorination, Survival, Cooling water, Biocides, Flow rate, Concentration(Composition), Invertebrates, Analysis of variance, New York.
Identifiers: Gammarus, Neomysis americana.

Striped bass, Gammarus and Neomysis from the Hudson River estuary were subjected to passage through a condenser tube simulator at various combinations of temperatures, flow rate and biocide concentration. Test conditions and procedures are described and results are presented.

PB-298 107/4GA PC **A03**/MF **A01**
Geological Survey, Tallahassee, FL. Water Resources Div.
Flood Profiles of the Pithlachascotee River, West-Central Florida.
Water-resources investigations,
J. F. Turner, Jr., W. R. Murphy, Jr., and C. V. Reeter. Jan 79, 29p USGS/WRD/WRI-79-015, USGS/WRI-78-100
Prepared in cooperation with Southwest Florida Water Management District, Brooksville.

Descriptors: *Flood plain zoning, *Floods, *Pithlachascotee River, Profiles, Flooding, Maps, Height, Regional planning, Drainage, Florida.
Identifiers: *Flood frequency, Inudation, Hernando County(Florida), Pasco County(Florida).

Data defining the magnitude and frequency of flooding are provided for a non-tidal 16-mile reach of the Pithlachascotee River. These data include areal flood-frequency relations and flood heights for the 2-, 2.33-, 5-, 10-, 25-, 50-, 100-, 200-, and 500-year recurrence intervals. Flood profiles are provided for the 2.33-, 5-, 10-, 100-, and 500-year recurrence intervals. Study results indicate that flood discharges in the study area are highly variable and are one-third to one-half of regional estimates. Differences between study area and regional estimates are due to large quantities of flood-water drainage to the regional aquifer system in the upper basin, a large karst area of about 138 square miles. Graded roads and bridges located at three sites along the upper study reach will be inundated by various frequency floods. Flood inundation maps can be prepared from flood data presented in this report.

PB-298 131/4GA PC **A06**/MF **A01**
Texas Water Development Board, Austin.
Quality of Water and Stratification of Possum Kingdom, Whitney, Hubbard Creek, Proctor and Belton Reservoirs,
Donald K. Leifeste, and Barney Popkin. Oct 68, 121p TDWR/R-85
Prepared by Geological Survey, Reston, VA., and Brazos River Authority, Waco, TX.

Descriptors: *Reservoirs, *Water pollution, *Brazos River, *Multiple purpose reservoirs, Stratification, Concentration(Composition), Salinity, Runoff, Chlorides, Mixing, Texas.
Identifiers: Thermal stratification.

The purpose of this study was to supplement the information available on the chemical quality of the streams and rivers in the Brazos River basin, and to obtain additional information concerning the stratification of Possum Kingdom, Whitney, Hubbard Creek, Proctor, and Belton Reservoirs. The specific goals of the study are: (1) To define the seasonal changes in the quality of the water and; (2) To determine the major factors controlling mixing and stratification.

PB-298 133/0GA PC **A05**/MF **A01**
Texas A and M Univ., College Station.
A Statistical Study of the Depth of Precipitable Water in Western Texas and Eastern New Mexico,
Samuel Erick Baker. Jun 69, 84p TDWR/R-96

Descriptors: *Weather modification, *Precipitation(Meteorology), *Water supply, Texas, New Mexico, Water vapor, Moisture content, Frequency distribution, Kurtosis, New Mexico, Texas.

Total depth of precipitable water for five stations in western Texas and eastern New Mexico is studied to determine a frequency distribution which will describe this climatic element. A conclusion evolving from the study is that a normal distribution adjusted for skewness and kurtosis may be used to describe adequately the frequency distribution presented by the observed depths of precipitable water grouped by pentads. An annual series of the yearly maximum depth of precipitable water from each of the five stations is plotted vs the recurrence interval.

PB-298 141/3GA PC **A02**/MF **A01**
Geological Survey, Lakewood, CO. Water Resources Div.
Plan of Study for the Northern Great Plains Regional Aquifer-System Analysis in Parts of Montana, North Dakota, South Dakota, and Wyoming.
Water-resources investigations,
George A. Dinwiddie. Feb 79, 25p USGS/WRI-79-34, USGS/WRD/WRI-79/016

Descriptors: *Ground water, *Project planning, *Water supply, *Water pollution, Sediments, Black Hills, Sandstones, Sedimentary rocks, Aquifers, Scheduling, Mathematical models, Hydrogeology, Geochemistry, Montana, North Dakota, South Dakota, Wyoming.
Identifiers: Northern Great Plains Region(United States), Water management(Applied).

The Northern Great Plains, an area of about 250,000 square miles in parts of Montana, North Dakota, South Dakota, and Wyoming, is underlain by an accumulation of sediments eroded from the Black Hills and from mountains to the west. Principal aquifers are areally extensive beds of sandstone within these sedimentary rocks, some at great depths. Anticipated future water needs dictate that available ground-water supplies be evaluated for management of this natural resource. The U.S. Geological Survey has started (1978) a 4-year study of the Northern Great Plains aquifer system. The objective of this study is to define availability and quality of ground water and to predict the effects of using this resource.

PB-298 145/4GA PC **A06**/MF **A01**
Environmental Protection Agency, Atlanta, GA. Region IV.
Environmental Impact Statement Conference Held at Atlanta Civic Center, Atlanta, Georgia, on February 22-23, 1979.
Final rept.
May 79, 125p EPA/904/9-79/040

Descriptors: *Environmental impacts, *Meetings, Regulations, Natural resources, Protection, Environmental impact statements.
Identifiers: Environmental quality, Wetlands, Air quality, Endangered species.

Council members on environmental quality discussed the fallacy that environmental regulation was a prime contribution to inflation. Presentations were also given on implementing the recent CEQ Regulations, wetland protection, Georgia's endangered species program, and air quality procedures. Additionally, the Workshops, included Environmental Impact Statement Review Procedures.

PB-298 158/7GA PC **A02**/MF **A01**
Texas Water Development Board, Austin.
Water-Loss Studies of Lake Corpus Christi, Nueces River Basin, Texas, 1949-65,
C. R. Gilbert. Jan 70, 18p TDWR/R-104
Prepared in cooperation with Geological Survey, Reston, VA.Color illustrations reproduced in black and white.

Descriptors: *Ground water, *Water loss, *Lake Corpus Christi, *Nueces River Basin, Water

supply, Surface waters, Hydrology, Channel improvements, Elevation, Stream flow, Texas.
Identifiers: *Water management(Applied).

The changes in the hydrologic regimen for surface and ground water in the reach of a river inundated by a newly formed reservoir often present interesting but unexpected problems. Because numerous reservoirs are being planned in this time of increasing need for additional municipal, industrial, irrigation, and recreational water supplies, more analyses documenting these changes are needed in order that efficient use be made of the available water resources. In April 1958 Lake Corpus Christi, which drains 16,656 square miles and is in south-central Texas on the Nueces River, was enlarged. This enlargement increased the elevation of the conservation pool by 20 feet and increased the potential inundated area by almost 30 square miles (old lake surface area was about 9 square miles). A cursory analysis of records of inflow to, change of contents in, and outflow from the lake after 1958 showed large losses of surface water in the reach studied. A more detailed study resulted in the findings presented in this report.

PB-298 172/8GA PC **A02**/MF **A01**
Texas Water Development Board, Austin.
Quantity and Quality of Low Flow in Sabine and Old Rivers Near Orange, Texas, September 12-15, 1967,
Jack Rawson, S. L. Johnson, and R. E. Smith.
Jan 69, 24p TDWR/R-90
Prepared by Geological Survey, Reston, VA., and Sabine River Authority of Texas, Orange.Color illustrations reproduced in black and white.

Descriptors: *Stream flow, *Sabine River, *Water pollution, Stream gages, Distribution(Property), Mathematical models, Oxygen, Dissolved gases, Old River, Texas.
Identifiers: *Low flow, Orange(Texas).

In April 1966, the U.S. Geological Survey began a series of investigations of the quantity and quality of flow in streams of the Sabine River basin between the Ruliff gaging station and Orange. Purposes of the investigations were: (1) To determine the distribution of flow in the mainstem and anabranches of the Sabine River in the study area; (2) to devise a method whereby the distribution of flow can be estimated from discharge records of the gaging station Sabine River near Ruliff; (3) to define the effects of tide on quality of the water; and (4) to determine the quality and quantity of tributary inflow.

PB-298 255/1GA PC **A04**/MF **A01**
Fish and Wildlife Service, Washington, DC.
Remote Sensing Applications for Fish and Wildlife Service.
Open file rept.,
Don H. Rodgers, and Elisabeth Cummings. Jun 76, 66p

Descriptors: *Ecology, *Fishes, *Wildlife, *Aerial photography, Remote sensing, Monitoring, Infrared radiation, Scientific satellites, Management, Conservation.
Identifiers: *Habitats.

This report is a review of the use of remote sensing in fish and wildlife management. Selected references and information sources are also included.

PB-298 261/9GA PC **A03**/MF **A01**
Fish and Wildlife Service, Kearneysville, WV. Eastern Energy and Land Use Team.
Impact Assessment of Water Resource Development Activities: A Dual Matrix Approach,
Thomas H. Yorke. Sep 78, 37p* FWS/OBS-78/82

Descriptors: *Project planning, *Water resources, Environmental impacts, Research projects, Reviews, Stream flow, Evaluation, Water supply, Channel flow, Forecasting, Physical properties, Economic development, Dams, Sewage treatment, Water wells, Reservoirs, Mathematical models.
Identifiers: *Water levels, *Alternative planning.

A dual-matrix system for reviewing and evaluating the impact of water development projects on fish and wildlife resources is discussed. The system will consist of generalized matrices; state-of-the-art literature reviews and syntheses for evaluating impacts, alternatives, and mitigation methodology; and a computer model for quantifying impacts. The generalized matrix presented in this report consists of summary statements of the impact of common water development projects on selected physical and chemical characteristics of streams.

PB-298 326/0GA PC **A12**/MF **A01**
Environmental Law Inst., Washington, DC.
Proceedings of the National Wetland Protection Symposium Held at Reston, Virginia on June 6-8, 1977,
John H. Montanari, and Jon A. Kusler. Nov 78, 253p* FWS/OBS-78/97

Descriptors: *Marshes, *Protection, *Meetings, Legislation, State government, Government policies, Management, National government, Environmental impacts, Inventories, Swamps, Water resources.
Identifiers: *Wetlands.

The proceedings contain the discussions of National leaders in wetland protection, water resources, and environmental law regarding the need for coordinated and strengthened state, local and Federal wetland protection policies to help shape future policies pertaining to wetland management.

PB-298 353/4GA PC **A17**/MF **A01**
West Virginia Univ., Morgantown. Div. of Forestry.
Surface Mining and Fish/Wildlife Needs in the Eastern United States,
David E. Samuel, Jay R. Stauffer, Charles H. Hocutt, and William T. Mason, Jr. Dec 78, 387p* FWS/OBS-78/81
Prepared in cooperation with Maryland Univ., Frostburg. Appalachian Environmental Lab. Proceedings of a Symposium Held at Morgantown, West Virginia on December 3-6, 1978.

Descriptors: *Surface mining, *Fishes, *Wildlife, *Environmental impacts, *Water pollution, *Meetings, Measurement, Reviews, Land reclamation, Improvement, Conservation, State government, National government, Government policies.
Identifiers: Habitats, Eastern Region(United States).

The report describes a state-of-the-art overview on surface mining in the eastern United States and the fish/wildlife relationships; best methods for measuring mining impacts; the effects of mining on the biota; mined land reclamation techniques for fish/wildlife benefits; and opportunities for improving fish/wildlife habitat on mined lands. Information is provided by the mining industry, conservation groups, and state and federal agencies.

PB-298 359/1GA PC **A03**/MF **A01**
Geological Survey, Tallahassee, FL. Water Resources Div.
Water-Quality Assessment of Runoff from a Rural Highway Bridge Near Tallahassee, Florida.
Water-resources investigations,
G. A. Irwin, and G. T. Losey. Jan 79, 34p USGS/WRD/WRI-79/025, USGS/WRI-79-1
Sponsored in part by Florida State Dept. of Transportation, Tallahassee.

Descriptors: *Runoff, *Water pollution, *Ochlockonee River, *Urban areas, *Highway bridges, Trace elements, Precipitation(Meteorology), Traffic, Regression analysis, Sampling, Stream flow, Vehicular traffic, Florida.
Identifiers: *Urban hydrology, Storm water runoff, Organic loading, Leon County(Florida), Gadsden County(Florida), Tallahassee(Florida).

Runoff from a rural highway bridge on U.S. 27 near Tallahassee, Florida, was found to have an insignificant water-quality loading impact on the Ochlockonee River. Potential annual-runoff loads on the bridge surface for virtually all constituents studied were less than one percent of those transported by the river at the study site. The loading rates for some parameters were significantly related to traffic counts, but the regression equations were limited to traffic ranges between 3,800 to 4,200 vehicles per day in 1977-78. Precipitation samples indicated that a significant percentage of the constituent loading to the bridge surface is from atmospheric deposition.

PB-298 389/8GA PC **A03**/MF **A01**
Southern Research Inst., Birmingham, AL.
Electrostatic Precipitator Technology Assessment: Visits in Japan, November 1977.
Final rept. Nov 77-Apr 78,
Grady B. Nichols. Jun 78, 47p EPA/600/7-78/110
Contract EPA-68-02-2610

Descriptors: *Air pollution control equipment, *Electrostatic precipitators, *Particles, Technology, Industrial wastes, Combustion products, Assessments.
Identifiers: *Foreign technology.

The report gives results of a particulate control technology assessment visit to Japan by a team of U.S. investigators. The visit included discussions with personnel from universities, industries, and other major installations involved with particulate control. Significant research activities were noted in both the academic and industrial sectors related to particulate control and measurements. The report summarizes results of the individual discussions, observations during the tour, and discussions of technical papers.

PB-298 418/5GA PC **A02**/MF **A01**
Northeastern Forest Experiment Station, Upper Darby, PA.
The Landowner and The Snowmobiler - Problem or Profit.
Final rept.,
George H. Moeller. 1971, 19p NEFES-79/64, FSRP/NE-206

Descriptors: *Recreation, Land use, Facilities, Real property, Services, Evaluation, Management, New York.
Identifiers: *Snowmobiling, Sport facilities, Land owners.

As interest in snowmobiling grows, and as land areas available for snowmobile use are restricted, the owner of open land may be able to make a profit by providing facilities for this new type of recreation. Case studies were made of eight commercial snowmobile enterprises in central New York State. Management problems are discussed, and the factors that the landowner should consider before going into the business are outlined.

PB-298 495/3GA PC **A07**/MF **A01**
Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
Performance of Continuously Reinforced Concrete Pavement in Illinois.
Civil engineering studies (Interim) 1976-77,
Scott A. LaCourisere, Michael I. Darter, and Scott A. Smiley. Dec 78, 149p UIUC/ENG-77/2018, TRANSPORTATION ENGINEERING SER-20, FHWA/IL/UI-172
Sponsored in part by Illinois State Dept. of Transportation, Springfield. Bureau of Materials and Physical Research. Report on Illinois Cooperative Highway Research Program Ser-172.

Descriptors: *Concrete pavements, *Interstate highway system, *Illinois, Cracking(Fracturing), Construction joints, Pavement bases, Aggregates, Maintenance.
Identifiers: *Continuously reinforced concrete, Pavement distress.

A study of the performance of Continuously Reinforced Concrete Pavement (CRCP) constructed on the Interstate highway system in Illinois has been conducted. The major purpose is to determine the types, severities, amounts, and causes of distress. Approximately 1230 miles of Interstate highway was surveyed, consisting of 7 to 10 in. (17-25 cm) slabs over granular and stabilized subbases. Distress found includes edge punchouts, steel ruptures, 'D' cracking, blowups, construction joint failures, lug rotation, longitudinal cracking, distress related to construction problems, pumping, and shoulder deterioration. Heavy truck loads, excess free moisture, deicing salts, construction practice and poor aggregate quality in the CRCP slab are the major factors causing distress. CRCP slab thickness and foundation support have a very significant effect on structural distress development.

PB-298 516/6GA PC **A04**/MF **A01**
National Highway Traffic Safety Administration, Washington, DC. Office of Vehicle Safety Standards.

The Campaign for Traffic Safety in Portugal (Campanha de Seguranca Rodoviaria).
Final technical rept. May-Dec 78,
Richard A. Ibison. 28 Dec 78, 64p DOT/HS-804 830
Text in English.

Descriptors: *Traffic safety, *Portugal, Cooperation, Local government, Mass media, Instructional materials, Safety belts, Motor vehicle accidents, Accident prevention.
Identifiers: Seat belts, *Foreign technology.

The report serves to acquaint traffic safety specialists in English-speaking countries with the outstanding work of the Portuguese Coordinating Committee of the Campaign for Traffic Safety (Campanha de Seguranca Rodoviaria). This campaign involved cooperation between various government and private agencies and had the full support of the media. The Campaign made particularly effective use of a large number of colorful brochures, 'handouts,' and posters. Reproductions of some of these (in black and white) are shown in the appendices to the report.

PB-298 612/3GA PC **A08**/MF **A01**
National Field Research Center, Inc., Washington, DC.
A Workforce and Training Profile for Solid Waste Management and Resource Recovery.
Final rept.,
Jack F. Seum, Darold E. Albright, Robert D. Oxberger, Gary S. Lance, and Linda Bardelmeier. 1979, 164p EPA/600/8-79/024
Grant EPA-T900-591-03

Descriptors: *Management planning, *Personnel management, *Materials recovery, Employment, National government, State government, Hazardous materials, Manpower, Urban areas, Rural areas, Education, Requirements.
Identifiers: *Solid waste management, Labor force.

This report, authorized as mandated in Section 7007(c) of the Resource Conservation and Recovery Act of 1976, is divided into the following topics: (1) a workforce profile and analysis section studying the workforce needs of public and private agencies involved in solid waste management and recovery; (2) a section analyzing what are considered by sources in the field to be the principal blockages to initial employment and career advancement in solid waste management; and (3) an analysis of the U.S. Environmental Protection Agency's responsibilities for workforce development and training activities. Information in the report was obtained primarily from personnel, on-site interviews with officials directly involved in solid waste management, including officials at Federal, State, and local levels; representatives from the private sector and from professional associations; and academic officials connected with postsecondary educational programs in solid waste management.

PB-298 633/9GA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Car-Sharing and Car-Pooling: A Review,
G. R. Green. c1978, 31p TRRL-SUPPLEMENTARY-358
Also pub. as ISSN-0305-1315.

Descriptors: *Urban transportation, Reviews, Coordination, Travel, Urban areas, Employment, Laws(Jurisprudence).
Identifiers: *Car pools, Ride sharing, Trip sharing, Van pools, Commuter transportation.

A literature review has been undertaken to assess the possible benefits and disbenefits of car-pooling and car-sharing in Britain. Relevant factors are identified and suggestions are made for gathering more information and conducting further studies. An Appendix gives an annotated list of the publications covered, which are almost all from the US, concerning methods and incentives for the formation of car-pools. There is practically no British or European literature. The general conclusions reached are that the potential gains from car-pooling and car-sharing are worth pursuing and are most likely to be obtained by concentrating on work journeys, particularly in urban areas and industrial estates, with sharing arrangements initiated at the workplaces rather than the home areas. It is also suggested that the legal position should be reviewed and any experiments set up following changes in the law should be monitored. (Copyright (c) Crown Copyright 1978.)

PB-298 634/7GA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Personal Travel in Towns: The Development of Models that Reflect the Real World,
M. G. Langdon, and C. G. B. Mitchell. c1978, 40p TRRL-SUPPLEMENTARY-369
Also pub. as ISSN-0305-1315.

Descriptors: *Urban transportation, *Travel patterns, Mathematical models, Travel time, Evaluation, Calibration, Predictions, Accuracy, Great Britain.
Identifiers: *Foreign technology, Traffic generation, Modal split models, Trip distribution models, Trip forecasting, Travel demand models.

Recent studies of urban travel are showing patterns of personal movement that would not be correctly predicted by conventional travel models. Examples are given of the stability of total trip numbers and of travel time budgets, of the restricted availability of private cars and of the lack of free choice between modes. Conventional and disaggregated models are examined and it is shown that accurate calibration is no guarantee of accurate predictive ability. Current trip generation models are considered to be satisfactory, and recent advances in modal split and trip distribution models are described. The fundamental question of the spatial and temporal stability of transport models, and hence the validity of these models as predictive tools, is discussed. It is concluded that the combinations of modelling with more disaggregated data, of incorporating existing improvements to modal split and trip distribution models, of allowing for restricted availability of some modes and other constraints on travellers' behaviour and of including the constraints and invariant factors noted in recent studies, will indeed lead to the development of transport models that do reflect the real world. (Copyright (c) Crown Copyright 1978.)

PB-298 637/0GA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Traffic Characteristics of a Network of Co-ordinated Rural Bus Services,
P. B. Ellson, and R. G. P. Tebb. c1978, 31p TRRL-SUPPLEMENTARY-367
Also pub. as ISSN-0305-1315.

Descriptors: *Urban transportation, Suburban areas, Rural areas, Services, Revenue, Vehicular traffic, Great Britain, Buses(Vehicles), Mass transportation.
Identifiers: Traffic flow, *Foreign technology.

A survey of the traffic patterns on an interconnected group of stage-carriage bus services in South and West Yorkshire is presented. Their value as inter-urban, urban-rural, and purely rural services is considered, together with the amount of traffic passing through the rural locations at which connections take place. The degree of bus-bus transfer traffic is also considered. Although the services as a whole show only marginal gains in traffic or revenue as a result of the provision of rural connecting services, it is shown that the interchange facilities were used by over eight per cent of the passengers at the sites, and that they were therefore of significant value to the rural community. It is suggested that local authorities elsewhere may find, in areas where bus services remain reasonably frequent, that the low support costs of providing rural connecting facilities are preferable to a financial commitment to the creation and operation of other kinds of rural bus schemes. (Copyright (c) Crown Copyright 1978.)

PB-298 647/9GA PC **A08**/MF **A01**
Kentucky Bureau of Highways, Lexington. Div. of Research.
Statewide Survey of Skid Resistances of Pavements.
Final rept.,
Rolands L. Rizenbergs, and James L. Burchett. Nov 78, 156p RR-512
Prepared in cooperation with National Highway Traffic Safety Administration, Washington, DC., and Federal Highway Administration, Washington, DC.

Descriptors: *Pavements, *Skid resistance, *Kentucky, Surveys, Highways, Motor vehicle accidents, Rainfall, Periodic variations, Statistical data.
Identifiers: *Skid testers.

In 1969, a research-type, skid-test trailer was acquired, U.S. routes were surveyed in 1970 and 1971, and the interstate and toll-road systems were surveyed in 1971. The data were used for research purposes and have been reported. The interstate and toll-road systems were surveyed again for research purposes in 1974. Since October 1974, surveys have been performed under highway safety project grants (interaccounted to 108, subsection OSKID). Primary and principal secondary roads, involving 4,613 miles (7,427 km), were surveyed in 1975. A second skid tester, a survey-type, was acquired in April 1976; and survey-testing of major, rural collector roads continued during 1976. This included 5,074 miles (8,166 km) of state secondary roads and 788 miles (1,268 km) of rural secondary roads. In 1977, the interstate and toll-road systems were re-surveyed, and a total of 1,576 miles (2,537 km) of predominately rural secondary roads were tested. The 1977 survey data are reported.

PB-298 684/2GA PC **A02**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
The Effect of Motorway Signals on Traffic Speed,
C. J. Lines. c1978, 21p TRRL-SUPPLEMENTARY-363
Also pub. as ISSN-0305-1315.

Descriptors: *Urban transportation, *Highway transportation, Traffic surveys, Urban areas, Rural areas, Great Britain.
Identifiers: *Traffic signs, Speed signs, *Speed studies, *Foreign technology, Traffic flow.

The effect on vehicle speed of advisory speed indications shown on motorway signals has been measured at two sites on the M1 motorway. On an urban section of the motorway at Scratchwood in N London, measurements were made of vehicle speeds before and after a set of signals mounted over the carriageway on a gantry. The signals were set to show an advisory speed of 50 mile/h. Control measurements were also made with the signals switched off. The average speed of light vehicles in the right-hand lane was reduced from about 78 mile/h to 71 mile/h (9 percent); in the center lane from about 69 to 63 mile/h (7 1/2 percent); and in the left-hand lane from about 57 to 55 mile/h (4 percent). Similar measurements were made on a rural section of the motorway at Newport Pagnell where the single signals are mounted on posts in the central reservation. The average speeds of light vehicles in the right-hand lane was reduced from about 77 mile/h to 69 1/2 mile/h (9 1/2 percent); in the center lane from about 68 to 63 mile/h (7 percent); and in the left-hand lane from about 55 to 52 mile/h (5 percent).

PB-298 690/9GA PC **A03**/MF **A01**
National Transportation Policy Study Commission, Washington, DC.
Review of Recent Interstate Commerce Commission Staff Research on Entry Control and Vehicle Utilization.
Working paper,
Merrill Roberts. Dec 78, 28p NTPSC/WP-79/02
Revision of report dated Feb 78.

Descriptors: *Highway transportation, *Trucks, Regulations, Policies, Common carriers, Interstate transportation, Cargo transportation.
Identifiers: Interstate Commerce Commission.

This National Transportation Policy Study Commission (NTPSC) report contains a review of selected staff research of the Interstate Commerce Commission (ICC) performed during 1977. The ICC work was believed relevant to the formulation of transport regulation. This paper presents recommendations for ways to redirect the focus of ICC research in order to provide an improved basis for policy analysis and decisionmaking.

PB-298 691/7GA PC **A02**/MF **A01**
Bureau of Reclamation, Denver, CO. Engineering and Research Center.

Low Froude Number Stilling Basin Design,
Robert L. George. Aug 78, 20p REC-ERC-78-8

Descriptors: *Hydraulic structures, *Stilling basins, *Hydraulic models, Check structures, Structural design, Hydraulic jump, Model tests, Spillways, Froude number.

Hydraulic model investigations were performed to supplement existing data and to develop general design criteria for low Froude number stilling basins. A generalized basin design for Froude numbers from 2.5 to 5.0 was developed from model tests and existing low Froude number designs. The recommended design is a relatively short stilling basin with chute blocks, baffle piers, and a dentated end sill.

PB-298 720/4GA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Requirements, Design and Comprehensibility of Leaflets to Promote Existing Bus Services,
P. B. Ellson, and R. G. P. Tebb. c1978, 32p TRRL-SUPPLEMENTARY-371
Also pub. as ISSN-0305-1315.Color illustrations reproduced in black and white.

Descriptors: *Mass transportation, *Buses(Vehicles), *Rural areas, Services, Promoting, Marketing, Great Britain, Routes.
Identifiers: *Foreign technology.

An information leaflet was devised during the course of an experiment in the generation of passenger traffic in an existing bus network. The requirements to be met by the leaflet were investigated and are set out in detail in the Report. The ways in which these requirements dictated the design of the leaflet are discussed and a copy of the final design is included at the back of this Report. Production costs of the leaflet are quoted and the successful methods adopted for distribution are described. Following the distribution of the leaflets, a survey of a sample of recipients was made in order to assess the comprehensibility of various features incorporated in the leaflet. The numerical and statistical results of the survey are given in detail, and conclusions are drawn on the comprehensibility of the various features that figured in the leaflets. (Copyright (c) Crown copyright 1978.)

PB-298 721/2GA PC **A02**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Bus-Actuated Signal Control at Isolated Intersections - A Simulation Model,
K. Wood. c1978, 25p TRRL-SUPPLEMENTARY-373
Also pub. as ISSN-0303-1315.

Descriptors: *Urban transportation, *Intersections, *Traffic engineering, Buses(Vehicles), Traffic signals, Detectors, Mathematical models, Computerized simulation, Travel time, Delay time, Great Britain.
Identifiers: *Foreign technology, *Bus priority systems, Traffic flow, Traffic management, Traffic models, Traffic actuated traffic signals, ICL 4-70 computers, BUSPAS computer program.

The computer simulation (BUSPAS) was designed to assess those bus priority techniques which can be used when buses are selectively detected in a mixed traffic stream. It was developed from an existing TRRL simulation; individual vehicle journeys are modelled, and a record is kept of each bus journey. Special detectors simulate selective bus detectors and the particular priority technique under investigation is specified by the user. Both the benefit to buses and the disbenefit to other traffic are predicted. Predictions of delay from BUSPAS were compared with the limited amount of experimental data. The agreement was satisfactory (typically within 3 seconds) but all the effects of the bus priority were small. BUSPAS has not been validated for situations where bus priority causes large changes in journey times. Normally BUSPAS uses a binomial distribution of vehicle arrivals but more bunched distributions have been tested. A measure of the degree of bunching of the traffic is output for each approach to the junction. The two variance reduction techniques which were used when testing BUSPAS are recommended for routine use. To simulate 2 hours of real time with a total flow through the intersection of 3600 vehicles an hour took about 15 minutes of elapsed time on an ICL 4-70 computer. (Copyright (c) Crown Copyright 1978.)

PB-298 722/0GA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Roadworks on Trunk and Principal Roads: The Standards of Signing,
A. D. Maclean. c1978, 29p TRRL-SUPPLEMENTARY-372
Also pub. as ISSN-0305-1315.

Descriptors: *Roads, Construction, Hazards, Vehicular traffic control, Traffic safety, Great Britain.
Identifiers: *Traffic signs, *Foreign technology.

Following considerable efforts in recent years by the Department of Transport to encourage an improvement in the standards of signing at roadworks, a survey of over 650 roadworks on Trunk and Principal Roads in the five-year period 1972-77 has shown that although the total numbers of signs used at each work have remained the same, there is some evidence that signs are used more selectively to give more information to motorists. Nevertheless, about 20 per cent of the main approaches to work sites remain with no useful advance signs - and the incidence of unsigned works is not confined only to minor works or those on low speed roads, although these account for the majority of the cases examined. For small statutory undertakers' works in particular, almost 40 per cent of the main approaches remain unsigned. The distances between works and their advance signs have not changed between 1972 and 1977; on average the Department's recommendations (Chapter 8 of the Traffic Signs Manual) are exceeded in this respect. (Copyright (c) Crown Copyright 1978.)

PB-298 723/8GA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Hull Freight Study: Assessment of Possible Area Lorry Controls,
R. S. Bartlett, D. R. Edmondson, and S. P. McCarthy. c1978, 42p TRRL-LR-829
Also pub. as ISSN-0305-1293.

Descriptors: *Cargo transportation, *Urban areas, Cargo vehicles, Evaluation, Environmental impacts, Benefit cost analysis, Vehicular traffic control, Great Britain.
Identifiers: *Foreign technology.

The movements of goods vehicles in a number of towns have been studied in order to evaluate the costs and benefits of possible measures to reduce the environmental disturbances caused by these vehicles. This report gives results of computer assessments of entry restrictions, with and without an exception for access, in Kingston-upon-Hull. Four different gross weight limits and eight different control areas have been considered. Hull lacks the environmentally insensitive roads necessary for such controls to be effective. As a result, the controls would not appreciably reduce the total exposure of people to goods vehicle nuisance: their main effect would be to transfer nuisance from one area to another. Of the 'no entry except for access' controls considered, only those on a local control area away from the town centre gave small environmental gains at low cost, but the diverted traffic might cause a traffic congestion problem at a point on the main route bypassing the control area. 'No entry' controls, without the exception for access, would, at best, produce marginal environmental improvements, and, for similar environmental benefits, would be more expensive than 'no entry except for access' controls. This confirms a similar conclusion of the earlier Swindon study. (Copyright (c) Crown Copyright 1978.)

PB-298 741/0GA PC **A02**/MF **A01**
Sydney Univ. (Australia). Civil Engineering Labs.
Large Deflection Analysis of Portal Frames.
Research rept.,
R. Q. Bridge. Oct 78, 25p R-331

Descriptors: *Framed structures, *Deformation, Stress strain diagrams, Bending moments, Deflection, Loads(Forces), Steel construction.
Identifiers: *Foreign technology.

A numerical method is described for the second-order, in-plane analysis of portal-type, steel, industrial frames accounting for both non-linear geometrical and material responses. Although primarily designed for determining the ultimate strength of frames, the same method can be used to predict the critical elastic frame buckling loads for any axial load configuration. Both elastic and inelastic post-buckling behavior can be examined as the method establishes compatible deflected shapes that satisfy equilibrium in both stable and unstable regions. Comparisons with results from tests on frames have confirmed the accuracy of the method. The method is well suited to mini-computer application as it is simple and makes no great demands on storage, the most complex operation being the inversion of 3x3 array.

PB-298 743/6GA PC **A03**/MF **A01**
Sydney Univ. (Australia). Civil Engineering Labs.
The Effect of Pre-Cracking on Column Behaviour.
Research rept.,
R. Q. Bridge. Apr 79, 27p R-344

Descriptors: *Columns(Supports), *Loads(Forces), Cracking(Fracturing), Reinforced concrete, Deformation, Stiffness.
Identifiers: *Foreign technology.

The results are presented of an experimental investigation into the behavior under load of steel-reinforced concrete columns containing cracks prior to the application of the load. The pre-cracking was produced both by restrained shrinkage and by the release of loads sustained for periods up to six years. Bending in both single and double curvature was examined using a range of end eccentricities. The results demonstrate that apart from reducing the stiffness of the columns, pre-cracking can reduce the ultimate load capacity below that for similar columns which are uncracked prior to loading. It is shown that the influence of pre-cracking can be accounted for in terms of an additional eccentricity of loading.

PB-298 751/9GA PC **A08**/MF **A01**
Simpson and Curtin, Philadelphia, PA.
Market Street West Transportation Study.
Final rept.
Mar 78, 152p UMTA-IT-09-0050-79-1
Prepared for Philadelphia Dept. of Public Property, PA. Prepared in cooperation with Wallace, McHarg, Roberts and Todd, Philadelphia, PA., and Urban Engineers, Inc., Philadelphia, PA.

Descriptors: *Urban transportation, Services, Planning, Rapid transit railways, Central city, Stations, Subways, Urban development, Pennsylvania.
Identifiers: Philadelphia(Pennsylvania), Market Street West Area, Transportation planning.

The study investigated current transit service and usage patterns. Results revealed the need for improved transit access west of 18th Street. Several alternative transit improvement proposals were developed to meet this need. After a two-stage analysis of the various transit proposals, the Study concluded that a new rapid transit station should be built to serve Market Street West on the Market/Frankford Line between the existing stations at 15th and 30th Streets. Various improvements to the subway-surface system, which is the only rail line that now penetrates the portion of the Study Area west of 18th Street, were also recommended.

PB-298 777/4GA PC **A02**/MF **A01**
Council on Environmental Quality, Washington, DC.
MERES (Matrix of Environmental Residuals for Energy Systems) and the Evaluation of Energy Alternatives.
May 75, 16p NSF/RA/E-75/335

Descriptors: *Environmental impacts, Government policies, Air pollution, Water pollution, Land use, Occupational diseases.
Identifiers: *Energy policy, *Data bases, Energy technology, Energy management, Solid wastes, MERES data base.

This brochure describes two new tools useful to individuals in government, industry, or education who are interested in the formulation or evaluation of environmental and energy policies and pro-

grams. The first is MERES (Matrix of Environmental Residuals for Energy Systems), a computerized data base specifying the water pollution, air pollution, solid waste, land use, and occupational health effects of present and future energy systems. Data on energy efficiencies and costs also are included. The second is Energy Alternatives: A Comparative Analysis, a reference document based in part on MERES data, which provides the necessary information for comparing alternative energy systems and presents a methodology for making comparisons. A major reason for developing MERES and preparing Energy Alternatives is to simplify the preparation and review of environmental impact statements for energy-related projects. These tools provide a readily available and uniform frame of reference to which agencies can refer for both the technology descriptions and environmental assessment of alternative energy sources or systems. Use of these tools allows agencies to shorten and improve environmental impact statements. This brochure is intended to provide an introduction to MERES and Energy Alternatives. It describes the data included in MERES, the nomenclature, and the data format in detail.

PB-298 783/2GA PC **A04**/MF **A01**
De Leuw, Cather and Co., San Francisco, CA.
Denver Off-Peak Free Fare Public Transit Experiment.
Interim rept. Feb-Sep 78,
Sherril Swan, and Robert McKnight. May 79, 59p
UMTA-CO-06-0010-79-1
Contract DOT-TSC-1409

Descriptors: *Urban transportation, Travel patterns, Attitudes, Profiles, Services, Evaluation, Colorado.
Identifiers: *Fare free transportation services, Demonstration programs, Denver(Colorado), Transit fares, Transit riders.

The Denver project investigates the effects of the elimination of off-peak fares on transit operations and costs, ridership, public attitudes, and regional travel patterns. The Denver experiment indicates that a systemwide free-fare program can be implemented with fairly minimal disruption and attract many new riders to transit during low-productivity hours. The distribution of the benefits of such a program among socio-economic and racial groups appears to be similar to that of the prior transit service. The cost of such free service is very high, constituting a major obstacle to implementation in most cities. However, if further study in Denver supports early indications, temporary free fare programs may be more successful in increasing the permanent ridership base than any other strategy yet attempted.

PB-298 828/5GA MF **A01**
Georgia Inst. of Tech., Atlanta.
Improved Pavement-Shoulder Joint Design.
Final rept.,
Richard D. Barksdale, and R. G. Hicks. Jun 79, 114p* TRB/NCHRP/REP-202, ISBN-0-309-02908-2
Report on National Cooperative Highway Research Program. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 79-66291. Also pub. as ISSN-0077-5614.
Microfiche copies only. Paper copy available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$7.20.

Descriptors: *Concrete pavements, *Construction joints, Joint sealers, Structural design, Subsurface drainage, Bituminous concretes, Portland cements, Specifications.
Identifiers: *Road shoulders.

This report is concerned with a study directed at devising means for avoiding or alleviating the problems frequently associated with the joint at the interface of portland cement concrete pavements and bituminous-surfaced shoulders. The research that is reported consisted of field studies directed at obtaining a better understanding of the influences of factors that effect the performance of pavement-shoulder joint systems, and laboratory studies aimed at devising test procedures and criteria to apply in the selection of joint sealants to assure satisfactory service. Recommendations are made for joint and shoulder designs and joint construction that should provide improved shoulder and pavement-shoulder joint performance. Specifications are proposed for sealants and sealant application. Guidelines are offered for a field evaluation of the design alternatives that are proposed.

PB-298 829/3GA MF **A01**
Transportation Research Board, Washington, DC.
Durability of Concrete Bridge Decks.
Final rept.
May 79, 69p* TRB/NCHRP/SYN-57, ISBN-0-309-02906-6
Report on National Cooperative Highway Research Program, Synthesis of Highway Practice. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 79-64881. Also pub. as ISSN-0547-5570.
Microfiche copies only. Paper copy available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$6.00.

Descriptors: *Bridge decks, *Concrete durability, Reinforcing steels, Maintenance, Protective coatings, Protective treatments, Corrosion resistance, Construction.

Detailed information is presented on the causes, prevention, evaluation, and rehabilitation of deck deterioration related to corrosion of steel reinforcement. NCHRP Synthesis 4, 'Concrete Bridge Deck Durability,' published in 1970, is still an excellent source of information on the nature of scaling and spalling and the causes of these mechanisms. However, engineers continue to search for methods of obtaining durable bridge decks, and the problem is becoming more urgent. It was reported in 1978 that nearly one-third of all highway bridge decks in the United States are seriously deteriorated due to corrosion of reinforcing steel. The cost of restoring these decks has been estimated at $6.3 billion. Virtually all protective systems currently in use to prevent corrosion of bridge deck reinforcing steel were developed following publication of Synthesis 4. In addition, methods of evaluation and rehabilitation have changed significantly since then. The current synthesis is, therefore, intended to supplement the earlier effort. This report of the Transportation Research Board reviews design and construction techniques currently in use to prevent deterioration of new bridge decks and also evaluation and rehabilitation techniques use to extend the service life of existing decks. Recommendations are included for research needs related to bridge deck durability.

PB-298 830/1GA PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Consequences of Deferred Maintenance.
Final rept.
May 79, 32p* ISBN-0-309-02907-4, TRB/NCHRP/SYN-58
Report on National Cooperative Highway Research Program. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 79-64882. Also pub. as ISSN-0547-5570.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$4.40.

Descriptors: *Highways, *Maintenance, Decision making, Planning, Cost engineering, Management, Deterioration, Quality, Highway transportation, Research.
Identifiers: *Deferred maintenance.

Expenditures for maintenance are not keeping pace with the needs of the nation's highways. Desirable maintenance activity is not being carried out, and the backlog of work needed to restore the facility to good condition is growing. Difficult judgments must be made in deciding to defer maintenance. To effectively manage a maintenance program, levels of service must be able to be defined, measured, and evaluated. This report of the Transportation Research Board reviews concepts for quantifying maintenance needs, setting priorities, and developing strategies. Relevant studies in progress are discussed and additional research needs are outlined.

PB-298 832/7GA MF **A01**
Transportation Research Board, Washington, DC.
Failure and Repair of Continuously Reinforced Concrete Pavement.
Final rept.
Jul 79, 50p* TRB/NCHRP/SYN-60, ISBN-0-309-02913-9
Report on National Cooperative Highway Research Program, Synthesis of Highway Practice. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 79-66364. Also pub. as ISSN-0547-5570.
Microfiche copies only. Paper copy available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$5.60.

Descriptors: *Concrete pavements, Design, Failure, Maintenance, Construction joints, Service life, Failure.
Identifiers: *Continuously reinforced concrete.

This synthesis will be of special interest and usefulness to highway design and maintenance engineers and others seeking information on design, construction, maintenance, and repair of continuously reinforced concrete pavement (CRCP). Detailed information is presented on maintenance and repair techniques currently used for CRCP. The performance of CRCP has revealed a number of failure modes that are trace-able to design, construction, materials, and maintenance deficiencies and such other factors as environmental conditions and trafffic loadings. This report of the Transportation Research Board includes a review of the cumulative experiences of states that have constructed and maintained CRCP. Guidelines for repair techniques are included, and areas of needed research are identified.

PB-298 833/5GA MF **A01**
Transportation Research Board, Washington, DC.
Relationship of Asphalt Cement Properties to Pavement Durability.
Final rept.
Jun 79, 51p* TRB/NCHRP/SYN-59, ISBN-0-309-02911-2
Report on National Cooperative Highway Research Program, Synthesis of Highway Practice. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 79-65727. Also pub. as ISSN-0547-5570.
Microfiche copies only. Paper copy available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$5.60.

Descriptors: *Flexible pavements, *Bituminous cements, Durability, Performance evaluation, Field tests, Stiffness methods, Mechanical tests.

This synthesis will be of special interest to materials engineers, construction engineers, designers, and others seeking information on factors affecting the performance of bituminous pavements. Detailed information is presented on how various properties of asphalt cement influence pavement performance. In recent years, apparent changes have evolved in the physical properties of asphalt cements used in pavement construction. Some of these properties are not controlled or are controlled only partially by AASHTO specifications. This report of the Transportation Research Board reviews all available information relating durability and performance of asphaltic concrete mixtures to the properties of asphalt cement. Recommendations for improved test procedures and criteria are included. The report concludes that hardness of the asphalt is the property most important to pavement performance.

PB-298 837/6GA PC **A07**/MF **A01**
International Labour Organisation, New York.
International Forum on Appropriate Industrial Technology Held at New Delhi/Anand, India on November 20-30, 1978. Appropriate Transport Facilities for the Rural Sector in Developing Countries.
Background paper,
I. J. Barwell, and J. D. Howe. 27 Oct 78, 139p
Report of Working Group No. 12, Appropriate Technology for Rural Transport. Sponsored in part by Agency for International Development, Washington, DC., and United Nations Industrial Development Organization, Vienna (Austria).

Descriptors: *Transportation, *Developing countries, Rural areas, Facilities, Vehicles, Marketing, Farms, Roads, Bicycles, Motorcycles, Policies, Recommendations.
Identifiers: *Rural transportation, Developing country application.

The report is concerned with the provision of appropriate transport facilities in the rural areas of developing countries. It is argued that the technologies applied in the past have been inappropriate to, and ineffective in meeting the transport needs of their poorest people. Further, there are alternative and more appropriate transport technologies which can better meet many of these needs. An essential element of any strategy for improving the transport capabilities of rural populations must be to provide a graduated choice of vehicles whose performance matches need and whose cost is in sensible relation to income. A range of basic vehicles is described--from aids to goods movement by man through to cheap motorized forms of transport--whose technology is shown to be more appropriate to the needs of many rural developing communities. Throughout the report various actions to promote more appropriate rural transport are identified. These are summarized into three categories: information, research and development; and production and marketing.

PB-298 842/6GA PC **A22**/MF **A01**
Reebie Associates, Greenwich, CT.
The Railroad Situation: A Perspective on the Present, Past and Future of the Railroad Industry.
Final rept.,
C. E. Urba, R. S. Reebie, C. J. Liba, M. J. Keale, and D. A. Isacowitz. Sep 78, 502p FRA/OPPD-79/7
Contract DOT-FR-760-5270

Descriptors: *Railroads, *Rail transportation, Financial management, Services, Cargo transportation, Competition, Forecasting, Evaluation, Labor relations, Management.
Identifiers: Railroad industry, Market shares.

The study was undertaken for the Federal Railroad Administration in partial compliance of Section 901 of the Railroad Revitalization and Regulatory Reform Act of 1976. The study provides an overview of the U.S. railroad industry. It describes the present situation and explains how the present situation evolved, concentrating primarily on the period 1929-1976. The likely future of the railroad industry over the next ten years is evaluated. The study concludes with a summary of how 'The Railroad Situation' is currently viewed by railroad management, railroad labor, shippers and other concerned parties.

PB-298 843/4GA PC **A11**/MF **A01**
Sperry Rand Corp., Great Neck, NY. Sperry Systems Management Div.
A Communications Trade-Off Study for Computerized Traffic Control. Volume 1. Final Report,
J. Scott, R. Gordon, B. Soicher, J. Dudek, and R. Kroeger. 22 Nov 78, 249p* GF-3704-1060-VOL-1, FHWA/RD-78/85
Contract DOT-FH-11-9275
See also Volume 2, PB-298 844.

Descriptors: *Vehicular traffic control, *Data transmission, Cost analysis, Telecommunication, Systems engineering, Automation, Specifications.
Identifiers: Computer applications, Trade off analyses.

The goal of this study is to provide information that will be useful in reducing costs of future computerized urban traffic control systems. The final report provides such information in the form of tutorial and reference material, cost computation procedures, and an example of a communication subsystem specification. The report consists of two volumes, the main text in Volume 1 and appendixes in Volume 2. Volume 1 of the report covers the following subjects: It discusses the principal functions of a computerized traffic control system, describes the types of data that must be transmitted, provides a brief tutorial overview of the communication methods available for providing such transmission, and shows how to estimate the transmission rate requirements for typical systems. It also describes communication methods applicable to computerized traffic control, examines various types of data transmission techniques, discusses factors affecting communication costs, and describes procedures for computing costs and utility measures, with examples. Volume 1 also contains an example of a specification for a communication system that uses a combination of wire pairs and air path optics as the transmission media. The appendixes in Volume 2 provide detailed information on various topics relevant to material contained in Volume 1.

PB-298 844/2GA PC **A09**/MF **A01**
Sperry Rand Corp., Great Neck, NY. Sperry Systems Management Div.
A Communications Trade-Off Study for Computerized Traffic Control. Volume 2. Appendixes.
Final rept.,
J. Scott, R. Gordon, B. Soicher, J. Dudek, and R. Kroeger. 22 Nov 78, 195p* GF-3704-1060-VOL-2, FHWA/RD-78/86
Contract DOT-FH-11-9275
See also Volume 1, PB-298 843.

Descriptors: *Vehicular traffic control, *Data transmission, Telecommunication, Systems engineering, Automation, Multiplexing, Errors, Reliability.
Identifiers: Computer applications, Trade off analyses.

The goal of this study is to provide information that will be useful in reducing costs of future computerized urban traffic control systems. The final report provides such information in the form of tutorial and reference material, cost computation procedures, and an example of a communication subsystem specification. The report consists of two volumes, the main text in Volume 1 and appendixes in Volume 2. The appendixes in Volume 2 provide detailed information on various topics relevant to material contained in Volume 1. Topics discussed include the following: Vehicle detector data communications; Multiplexing and modulation; Error detection and correction; Reliability and availability; Characteristics of existing computerized traffic control systems; User owned wire pair communication; Leased line communications; Coax cable communications; Air path optical communications; Fiber optics communications; Radio communication; Power line communication techniques.

PB-298 849/1GA PC **A02**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Level-of-Service Concepts in Urban Public Transportation,
William Taylor, and John Brogan. Sep 78, 22p UM-HSRI-78-50
Sponsored in part by Michigan State Highway Commission, Lansing.

Descriptors: *Urban transportation, *Services, Facilities, Cost effectiveness, Quality, Systems analysis.
Identifiers: Transit riders.

The study examines the level-of-service concept as it might be applied to public transportation services. It describes proposed definitions of public transportation level of service based on both system and rider attributes. The variation in public transportation quality as viewed by various user market segments is examined, and the sensitivity or demand elasticity to the various factors constituting 'level of service' is then made. Finally, a proposed study methodology to evaluate the increased level of service provided to user groups in line with their perceived measures of service quality is outlined.

PB-298 851/7GA PC **A02**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Optimization in Dial-a-Ride System Analysis: A Comparison of Recent Modelling and an Expected Value Model.
Final task rept. 1 Jun-1 Aug 78,
Nancy E. Wallace. 1 Aug 78, 24p UM-HSRI-78-32
Sponsored in part by Michigan Dept. of State Highways and Transportation, Lansing, and Michigan State Highway Commission, Lansing.

Descriptors: *Systems analysis, Mathematical models, Optimization, Buses(Vehicles), Algorithms, Design, Planning, Urban transportation.
Identifiers: *Dial a ride systems, Demand responsive transportation systems.

A literature review of optimization models for small bus system designs is presented. Maximization algorithms are briefly discussed for project CARS at Massachusetts Institute of Technology, project BUSTOP at Northwestern, a model developed by Tapan Datta at Wayne State University, and a mean value model developed at Ford Motor Company and programmed at The University of Michigan. The design features of the models are presented and suggestions are offered as to the applicability of the models to the transit authority planning environment.

PB-298 854/1GA PC **A04**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Prediction of Pavement Performance and the Design of Overlays.
Laboratory rept.,
C. K. Kennedy, and N. W. Lister. c1978, 74p*
TRRL-LR-833
Also pub. as ISSN-0305-1293.

Descriptors: *Flexible pavements, Performance evaluation, Deflection, Measuring instruments, Service life, Coverings, Design, Predictions.
Identifiers: *Pavement overlays, *Foreign technology.

The deflection of a flexible road pavement under a heavy wheel load moving at creep speed can be used to predict the future structural performance of the pavement and to design the strengthening of it by overlaying with bituminous materials. The present report describes the adjustment of measured deflections to standard values suitable for design purposes and their use, together with the appropriate traffic data, for the prediction of remaining pavement life and for the design of overlay thickness. The technique sometimes requires information from cores and trial holes to allow the appropriate decisions for a particular pavement to be made. (Copyright (c) Crown Copyright 1978.)

PB-298 864/0GA PC **A09**/MF **A01**
National Research Council, Washington, DC. Committee on Transportation.
Forecasts of Freight System Demand and Related Research Needs.
Aug 79, 196p DOT/RSPA/DPB/50-79/20
Contract DOT-OS-70001
Proceedings of a Workshop Held at Washington, DC. on June 12-13, 1978.

Descriptors: *Cargo transportation, *Meetings, Forecasting, Demand(Economics), Transportation models, Planning, Rail transportation, Highway transportation, Commodities, Bulk cargo, Coal, Research.
Identifiers: Transportation planning, Motor carriers, Durable goods, Nondurable goods.

The committee identified the need to improve the forecasting of demand for freight movement as a particularly pressing issue. The workshop brought together 120 participants who represented a broad range of active interests in freight movement and forecasting. The presentations and discussions of the plenary session were organized under the following headings: (1) Aggregate and Major Freight Category Demand Estimation; (2) Transportation Modeling and Freight Demand Trends; and (3) Corporate Planning--Major Freight Category Trends in Shipment of Manufactured and Bulk Commodities.

PB-298 865/7GA PC **A03**/MF **A01**
New Jersey Dept. of Transportation, Trenton. Div. of Research and Development.
Bridge Construction with Unpainted, High Strength, Low-Alloy Steel: The Aesthetic Problems,
Bruce Cosaboom, and Gregory Mehalchick. Dec 78, 29p 79-002-7799, FHWA/NJ-79-002-7799

Descriptors: *Highway bridges, *Staining, Esthetic properties, Low alloy steels, High strength steels, Barrier coatings, Bridge piers, Bridge abutments.

Use of high-strength, low-alloy steel (ASTM A-242 and A-588) in bridges, as a means of reducing maintenance costs, results in an aesthetic problem of rust staining of abutments and piers. Staining

occurs as rust particles, carried by runoff, penetrate into the abutment and pier concrete. The objective of this part of the project is the elimination, easy removal, or camouflaging of staining. There are numerous solutions to the problem. The scope of the project covers the application of a coating to provide an impenetrable layer. Two such products were tested: Barrier and Thompson's Water Seal 101. Following initial testing, it was found only Barrier held some promise. Further research, in which Barrier was subjected to more severe rust staining, resulted in failure of the product to provide the impenetrable layer. The aesthetic problems are not insurmountable, but various alternatives appear to offer more success than the use of a penetrant-resistant coating.

PB-298 893/9GA PC **A04**/MF **A01**
De Leuw, Cather and Co., New York.
Findings of Preliminary Analyses of the Trenton Off-Peak Fare-Free Transit Demonstration.
Interim rept. Nov 77-Jun 78,
David L. Connor. Jan 79, 58p UMTA-NJ-52-0001-79-1
Contract DOT-TSC-1409
See also report dated Dec 78, PB-291 455.

Descriptors: *Urban transportation, Travel patterns, Attitudes, Profiles, Services, Evaluation, New Jersey.
Identifiers: *Fare free transportation services, Trenton(New Jersey), Transit riders, Mercer County(New Jersey), *Transit fares, Demonstration programs.

The report was prepared as an interim informational summary of the progress of the Trenton Fare-Free Demonstration. It presents findings of interim analyses regarding ridership impacts; passenger profiles and trip characteristics; and transportation supply and cost impacts. Given the limitation of this report, it can be useful as an interim informational summary pending completion of the full evaluation and preparation of the final project report. The report concludes that: Mercer Metro off-peak ridership has increased 45-50 percent during all free-fare periods; the Bus drivers have complained that the program has caused them to be late more often and to miss breaks because of more passengers and additional stops; and the cost of additional bus and driver service has increased but has not yet been estimated.

PB-298 895/4GA PC **A07**/MF **A01**
Missouri Univ.-Columbia, Puxico. Gaylord Memorial Lab.
Floral and Faunal Changes in Lowland Hardwood Forests in Missouri Resulting from Channelization, Drainage, and Impoundment,
Leigh H. Fredrickson. Jan 79, 146p FWS/OBS-78/91
Contract DI-14-16-0008-1195

Descriptors: *Wildlife, *Ecology, *Aquatic animals, *Forest land, *Channel improvements, *Plant growth, *Saint Francis River, *Greentree reservoirs, *Water supply, Drainage, Impoundment, Inventories, Abundance, Monitoring, Levees, Water loss, Flood routing, Hardwoods, Missouri.
Identifiers: Forest watersheds, Bioindicators.

This study attempts to expand understanding of the impacts of water resource developments and wetland wildlife management on lowland hardwood forests and to examine techniques for effective habitat assessment. The flora and fauna were monitored for one year in lowland hardwood forests on three sites near the St. Francis River, Missouri. Line transects, point-center quarter method, increment cores, and canopy photos were used to monitor vegetative conditions. Mist-netting, belt transects, aerial inventories, and snap-trapping were techniques used to monitor animal presence and abundance. Records on surface water, ground water, surface soil moisture, precipitation, and St. Francis River stages and discharges were maintained.

PB-298 906/9GA PC **A02**/MF **A01**
Texas Historical Commission, Austin.
Houston Conference On the Revitalization of the Inner City, Held at Houston, Texas on May 5-6, 1978.
Aug 79, 25p EDA-79-0135
Grant EDA-08-6-27556

Descriptors: *Economic development, *Technical assistance, *Urban renewal, Central city, Project management, Cooperation, Coordination, Urban planning, Local government, Neighborhoods, Citizen participation, Texas.
Identifiers: Houston(Texas).

A Conference on the Revitalization of the Inner City was a community effort. The conference fulfilled an important task and satisfied the major goals of its sponsors. It provided a forum for discussing redevelopment of Houston's inner city. The Foundation and the Commission involvement with revitalization proposed the conference to help educate those involved with revitalization by providing concrete examples of successful projects in Houston and other cities, and consequently serve as a catalyst for solving the city's problems. The revitalization process required a cooperative effort between government, private enterprise and Houston citizens.

PB-298 907/7GA PC **A04**/MF **A01**
Department of Transportation, Washington, DC. Office of the Secretary.
Transportation and the Future.
Final rept.,
Norman G. Paulhus, Jr. Jan 79, 71p* DOT-I-79-1

Descriptors: *Transportation, *Technology innovation, Urban transportation, Interstate transportation, Cargo transportation, Energy conservation, Electric motors, Automation, Supersonic aircraft, Hypersonic aircraft, Short takeoff aircraft, Air transportation, Electric power, Automobiles, Rail transportation, Buses(Vehicles), Containerizing, Space flight.
Identifiers: Rural transportation, Intermodal transportation, Tracked levitated research vehicles, People movers, Transit malls, Paratransit, Space shuttles.

The document covers technological developments in connection with urban, rural, intercity, cargo and space transportation over the next twenty to thirty years. Demographic changes will place an added emphasis on automated systems around the turn of the Century, and energy constraints may make electrically-powered systems more attractive. The passenger automobile will probably retain dominance of transportation; public tranportation systems in urban areas will evolve into more complex, multi-element operations serving both downtown and the suburbs. Energy constraints may lead to added reliance on rail and bus travel for intercity runs. Cargo vehicles will make more sophisticated use of intermodal containers. Finally, the advent of the space shuttle will completely alter the nature of orbital missions.

PB-298 917/6GA PC **A02**
Florida Univ., Gainesville. Coll. of Law.
Drawing the Line at the Oceanfront. The Role of Coastal Construction Setback Lines in Regulating Development of the Coastal Zone,
Frank E. Maloney, and Anthony J. O'Donnell, Jr. 1978, 23p NOAA-79070202
Grant NOAA-04-6-158-44055
Pub. in University of Florida Law Review, v30 p383-403 1978.

Descriptors: *Land use, *Coastal zone management, Ordnances, Regulations, Land development, Population growth, Construction, Project planning, Licenses.
Identifiers: Sea Grant program, Wetlands, Reprints.

Rapid and largely unrestrained real estate development along the coastal zone poses unique problems of land use regulation and planning. Two dichotomies permeate this theme: The first is the ubiquitous conflict between the right of a landowner to the free use of his land and the power of the state to regulate unreasonable use of property; second is the desire for growth and development, which historically and almost by definition disregarded ecological and environmental consequences. Fortunately, our coastal environment increasingly is being considered a valuable treasure rather than an exploitable one. Obviously, resolution of the competing interests will involve a delicate balancing process. Comprehensive local regulation of coastal construction and excavation can serve a vital and necessary function in resolving coastal zone problems. The model ordinance which follows is designed to assist coastal communities in implementing their planning programs.

PB-298 932/5GA PC **A07**/MF **A01**
Louisiana State Univ., Baton Rouge. Center for Wetland Resources.
Shoreline Erosion in Coastal Louisiana: Inventory and Assessment.
Final rept.,
R. D. Adams, P. J. Banas, R. H. Baumann, J. H. Blackmon, and W. G. McIntire. Aug 78, 150p NOAA-79061804
Prepared in cooperation with Louisiana Dept. of Transportation and Development, Baton Rouge.

Descriptors: *Beach erosion, *Shore protection, *Coastal zone management, Louisiana, Inventories, Monitoring, Assessments, Erosion control, Coastal topographic features, Feasibility, Structures, Breakwaters, Vegetation.
Identifiers: Structural methods, Non structural alternatives.

The accelerated erosion rate combined with the highly dynamic nature of the Louisiana coastline area necessitate periodic monitoring of erosion in order to identify the extent of the problem both physically and culturally. The objectives of this study are to develop a methodology that would enable decision makers to: (1) Assess the extent to which shoreline erosion is presently occurring in coastal Louisiana; (2) determine the geographic variability of erosion rates across coastal Louisiana and relate this to variability in the physical and cultural environment; (3) assess the implications of shoreline erosion on the physical and cultural environment; (4) designate areas for erosion control consideration; and (5) assess the feasibility of structural and nonstructural procedures for managing erosion along designated areas of Louisiana coast.

PB-298 935/8GA PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Stabilization and Compaction,
L. Raad, C. L. Monismith, J. K. Mitchell, R. M. Quigley, and L. R. Di Nardo. 1978, 44p* TRB/TRR-690, ISBN-0-309-02836-1
Library of Congress catalog card no. 79-17962.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$3.00.

Descriptors: *Pavement bases, *Soil stabilization, *Soil compacting, Soil mechanics, Soil cement, Soil wafer, Moisture content, Density ratio, Soil tests.

The 7 papers in this report deal with the following areas: crack propagation in soil-cement bases subjected to repeated wheel loads; clay mineral weathering controls on lime and cement stabilization of southwestern Ontario clay borrow (abridgment); concerning pressure-grouted soil anchors; storage, retrieval, and analysis of compacted shale data; using indicative properties to predict the density-moisture relationship of soils; method for specifying soil compaction; and base-course gravel-compaction control by the comprimeter.

PB-298 941/6GA PC **A03**/MF **A01**
Transportation Research Board, Washington, DC.
Adhesive Materials, Paints, and Corrosion,
Steven D. Hofener, David A. Law, Gerald L. Anania, W. R. Tooke, Jr., and H. J. Fromm. 1978, 47p* TRB/TRR-692, ISBN-0-309-02838-8
Library of Congress catalog card no. 79-17217.
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$3.00.

Descriptors: *Traffic markings, *Paints, *Corrosion, *Concretes, Concrete pavements, Thermoplastics, Adhesion, Protective coatings, Highway bridges, Reinforcing steels, Accelerated tests, Electric potential, Measurement, Concrete polymer composites, Quality control, Measuring instruments, Bridge decks.

The 6 papers in this report deal with the following areas: improving thermoplastic stripe adhesion on concrete pavements; acceptance sampling of structural paints; accelerated performance testing of bridge paints for seacoast environments; measurement of polarized potentials in concrete bridge decks; methods of determining corrosion suscepti-

bility of steel in concrete; and measurement of cement content by using nuclear backscatter-and-absorption gauge.

PB-298 942/4GA MF **A01**
Howard, Needles, Tammen, and Bergendoff, Fairfield, NJ.
Bridge Deck Joint-Sealing Systems: Evaluation and Performance Specification.
Final rept.
Jun 79, 56p* TRB/NCHRP/REP-204, ISBN-0-309-02910-4
Report on National Cooperative Highway Research program. Sponsored in part by Federal Highway Administration, Washington, DC., and American Association of State Highway and Transportation Officials, Washington, DC. Library of Congress catalog card no. 79-65828. Also pub. as ISSN 0077-5614.
Microfiche copies only. Paper copy available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$5.60.

Descriptors: *Bridge decks, *Construction joints, Expansion joints, Specifications, Construction management, Structural design, Field tests, Questionnaires, Prefabrication.

This report includes an investigation on current and past use of prefabricated proprietary bridge deck joint-sealing systems by highway agencies throughout the U.S. and a number of other countries. The good features in a wide variety of products are examined; reported shortcomings in their serviceability under traffic (notably their failure to be entirely watertight) are searched out. The major contributory input to collection of field experiences with such systems was responses to a comprehensive questionnaire sent to all State highway departments and numerous toll authorities. Evaluations of all findings resulted in preparation of a practical and detailed performance specification for rubber membrane- and cushion-seal systems up to 4 in. (102 mm) total movement. (Cellular compression seals are not included.) This specification includes extensive requirements for pre-installation and post-installation testing and places on the contractor for installing systems having such attributes as water-tightness, low noise, puncture resistance, endurance to temperature extremes, long service under traffic, etc. In-service guarantee clauses holding the contractor liable for joint failure for a few years were judged to be unenforceable as a practical contractural obligation; nevertheless, suggested requirements and field tests are given for those highway agencies electing to include them.

PB-298 955/6GA PC **A05**/MF **A01**
Research Group, Inc., Atlanta, GA.
Floodplain Development Pressures and Federal Programs. Part I: Case Study Analysis and Recommendations for the '201' Wastewater Treatment Works Program.
Final rept.,
Lillian F. Dean. May 79, 80p* EPA/130/1-79/001A
Contract EPA-68-01-3923
See also Part 2, PB-298 956.
Also available in set of 3 reports PC E09, PB-298 954-SET.

Descriptors: *Flood plains, *Federal assistance programs, *Urban development, *Flood control, National government, Local government, Hazards, Protection, Environmental impacts, Sewers, Sewage treatment, Government policies, Community development, Land use, Regulations, Standards, Criteria, Management.
Identifiers: Federal Water Pollution Control Act Amendments of 1972, Case studies, Sewage treatment plants, Environmental Protection Agency, Southeast Region(United States), Midwest Region(United States), Western Region(United States).

The individual and combined effects of federal programs on development in floodplains are identified. Based on those findings, ways in which the '201' Wastewater Treatment Works Program of the U.S. Environmental Protection Agency can reduce floodplain development pressures are recommended. Major tasks in developing those recommendations were as follows: (1) Thirty-one case studies of the impact of federal programs on floodplain development were completed in the Southeast, West, and Midwest regions. Interviews with planning directors and other knowledgeable persons at the local government level provided the basic information; (2) Meetings with the EPA Regional Offices in Atlanta, Kansas City and Denver were held to review present methods for implementing floodplain policy related to '201' wastewater treatment facilities; (3) Federal programs which potentially can affect floodplain development were reviewed to identify the range of methods and approaches presently used to mitigate floodplain development pressures; and (4) Major decision points in the '201' Wastewater Treatment Works Program which can affect floodplain impacts were identified, based on a review of program regulations and guidance materials.

PB-298 956/4GA PC **A07**/MF **A01**
Research Group, Inc., Atlanta, GA.
Floodplain Development Pressures and Federal Programs. Part II: Methods Used by Federal Programs to Reduce Floodplain Development Pressures.
Final rept.,
Lillian F. Dean. May 78, 129p* EPA/130/1-79/001B
Contract EPA-68-01-3923
See also Part 1, PB-298 955, and Part 2, PB-298 957.
Also available in set of 3 reports PC E09, PB-298 954-SET.

Descriptors: *Flood plains, *Federal assistance programs, *Urban development, *Flood control, National government, Local government, Land development, Community development, Environmental impacts, Government policies, Land use, Sewage treatment, Sewers, Regulations, Coastal zone management, Water quality.
Identifiers: Federal Water Pollution Control Act Amendments of 1972, Environmental Protection Agency, Pollution control, Sewage treatment plants, Wetlands, Southeast Region(United States), Midwest Region(United States), Western Region(United States).

The report describes federal programs which can affect the floodplain and floodplain impact mitigation measures used in federal programs. In addition, major decision points in the '201' Wastewater Treatment Works Program which relate to the effect of the '201' Program on floodplain development are assessed and floodplain impact mitigation measures potentially applicable to the '201' Program are identified. The report is organized in five chapters: Chapter I--An Introduction to the Report and A History of Federal Government Efforts to Protect Floodplains; Chapter II--A Description of Federal Programs Which Can Affect Floodplains; Chapter III--An Identification of Floodplain Impact Mitigation Measures Used in Federal Programs; Chapter IV--An Assessment of Decision Points in the '201' Wastewater Treatment Works Program Related to Floodplain Impacts; and Chapter V--An Identification of Floodplain Impact Mitigation Measures From Other Federal Programs Which are Applicable to the '201' Wastewater Treatment Works Program. This report constitutes Phase I of a two-phase study for the Office of Federal Activities, U.S. Environmental Protection Agency.

PB-298 957/2GA PC **A08**/MF **A01**
Research Group, Inc., Atlanta, GA.
Floodplain Development Pressures and Federal Programs. Part III: Case Study Reports.
Final rept.,
Lillian F. Dean. Jun 78, 160p* EPA/130/1-79/001C
Contract EPA-68-01-3923
See also Part 2, PB-298 956.
Also available in set of 3 reports PC E09, PB-298 954-SET.

Descriptors: *Flood plains, *Federal assistance programs, *Urban development, *Flood control, National government, Local government, Land development, Community development, Environmental impacts, Government policies, Land use, Sewage treatment, Sewers, Regulations, Coastal zone management, Water quality.
Identifiers: Federal Water Pollution Control Act Amendments of 1972, Environmental Protection Agency, Pollution control, Sewage treatment plants, Wetlands, Case studies, Midwest Region(United States), Western Region(United States), Southeast Region(United States).

Thirty-one case studies of floodplain development pressures and federal programs are documented in this report. The cases document the sequence of federal programs and the relationship of the programs to community development and floodplain development. All localities selected for the case studies were recipients of grants through the '201' Wastewater Treatment Works Program of The U.S. Environmental Protection Agency. Case study reports are included in the section which follows. The following information about each case study is present: Location of the community; Population trends; Characteristics of the floodplain; Federal programs in the community; and Effect of federal programs on floodplain development. The map following each case study report illustrates the general location of the 100-year floodplain. The locations of major federal construction and development programs are indicated.

PB-298 979/6GA PC **A07**/MF **A01**
Systan, Inc., Los Altos, CA.
Implementing the Rochester Community Transit Service Demonstration.
Interim rept. Nov 77-Sep 78,
Michael Holoszyc, and Debra A. Newman. May 79, 140p DOT-TSC-UMTA-79-20, UMTA-NY-06-0048-79-1
Contract DOT-TSC-1416
See also report dated Mar 79, PB-296 875.

Descriptors: *Urban transportation, Buses(Vehicles), Services, Suburban areas, Handicapped persons, Scheduling, Operations, Minicomputers, Operating costs, Financial management, Local government, Transportation management, New York.
Identifiers: Demonstration projects, Rochester(New York), *Demand responsive transportation systems.

The report describes the implementation process and the early impacts of the Rochester Community Transit Service demonstration in four suburbs of Rochester, New York. The demonstration project is an outgrowth of an earlier one which ended in October 1977. The new demonstration will continue until July 1979. In the first demonstration, a variety of demand-responsive services were operated in two Rochester suburbs -- Greece and Irondequoit. In the new demonstration, the door-to-door dial-a-ride service was expanded in July 1978 to two additional suburbs -- Brighton and Henrietta, and the handicapped service became a region-wide operation over a four-month period starting in July 1978. In addition, all four dial-a-ride service areas will eventually have computerized scheduling and dispatching using a dedicated minicomputer. The new demonstration is largely concerned with two institutional innovations developed by the Rochester-Genesee Regional Transportation Authority to deal with the problems of high operating costs and insufficient local funding availability. These innovations are the use of a competitively selected private operator and the shifting of the funding responsibility to the suburban towns served by dial-a-ride. The report describes the events leading to these innovations, their implementation, and their results and implications thus far.

PB-299 118/0GA PC **A17**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Drugs and Driving: Information Needs and Research Requirements.
Final rept. Jul 75-Aug 78,
Kent B. Joscelyn, Ralph K. Jones, Roger P. Maickel, and Alan C. Donelson. Apr 79, 395p* UM-HSRI-79-1, DOT-HS-804 774
Contract DOT-HS-5-01217

Descriptors: *Traffic safety, *Drugs, Performance evaluation, Behavior, Perception, Drug tolerance, Accident prevention, Evaluation, Collision research, Highway transportation, Motor vehicle operators, Motor vehicle accidents.
Identifiers: Human factors.

The report presents the results of a comprehensive review and analysis of the relationship between drugs (other than alcohol alone) and highway safety. The report identifies research to define

the problem of drugs and driving. Epidemiologic and experimental studies are examined in the review. Also reviewed is literature on approaches to countermeasures in this area of highway safety. Methodologic issues, problem areas, and information needs in drug and driving research are extensively discussed. Conclusions and recommendations for near-term research are developed, and a systematic program of research is suggested for implementing the recommendations.

PB-299 164/4GA PC **A05**/MF **A01**
National Oceanic and Atmospheric Administration, Boulder, CO. Marine Ecosystems Analysis Program Office.
Suspended Particulate Matter in the New York Bight Apex: Observations from April 1974 through January 1975.
Technical memo.,
Terry A. Nelsen. May 79, 94p NOAA-TM-ERL-MESA-42, NOAA-79072305

Descriptors: *Sewage disposal, *Water pollution, *New York Bight, *Continental shelves, Particles, Concentration(Composition), Distribution(Property), Periodic variations, Plankton, Suspended sediments, Spoil, Sludge disposal, Industrial wastes, Refuse, Construction, Mixtures.
Identifiers: *Outer continental shelves, MESA project, *Ocean waste disposal, Baseline studies.

Suspended particulate matter (SPM) concentration, distribution, and composition in the New York Bight apex was studied. This report covers SPM data for the period April 1974 through January 1975, and extends the time series initiated in 1973. Suspended particulate matter in the New York Bight apex can be broadly classified as natural and anthropogenic. Natural sources include the mineral and biological components of river runoff, plankton, eolian sources, resuspended bottom sediments, and materials advected into the apex by continental shelf currents. To this natural particulate matrix man introduces a complex mixture of particles derived from dredged materials, construction debris, sewage sludge, and industrial acid waste material.

PB-299 187/5GA PC **A02**/MF **A01**
Rutgers - The State Univ., New Brunswick, NJ. Dept. of Chemical and Biochemical Engineering.
Transient Analysis of Water Quality.
Final technical completion rept.,
Burton Davidson, R. Vichnevetsky, and R. Chella. 6 Apr 79, 6p W79-09059, OWRT-A-045-NJ(4)
Contract DI-14-34-0001-8032

Descriptors: *Delaware River, *Estuaries, *Water quality, Mathematical models, Estimates, Computerized simulation, Dispersions, Coefficients, Ocean tides, Tidewater, Systems engineering, Salinity, Biochemical oxygen demand, Enthalpy.
Identifiers: Trenton(New Jersey), Wilmington(Delaware).

The research project was designed to formulate an intra-tidal-time, deterministic, one-dimensional, nonisothermal, multistate-variable, water quality model for the Upper Delaware River estuary system. The results achieved include the development of numerical techniques for estimating best-distributed Manning's roughness coefficients for open estuarial river systems. The publication giving these results is cited.

PB-299 265/9GA PC **A14**/MF **A01**
Health Effects Research Lab., Cincinnati, OH.
Waterborne Transmission of Giardiasis: Proceedings of a Symposium Held at Cincinnati, Ohio on September 18-20, 1978,
Walter Jakubowski, and John C. Hoff. Jun 79, 321p* EPA/600/9-79/001

Descriptors: *Giardiasis, *Water pollution, *Meetings, Protozoal diseases, Water supply, Potable water, Microorganism control, Epidemiology, Reviews, Water treatment(Water).
Identifiers: *Path of Pollutants, *Drinking water.

The Health Effects Research Laboratory and the Municipal Environmental Research Laboratory of the U.S. Environmental Protection Agency sponsored a National Symposium on Waterborne Transmission of Giardiasis in Cincinnati on September 18-20, 1978. The symposium brought together scientists, engineers, and federal, state, and local public health officials for the purpose of determining the state-of-knowledge regarding the etiologic agent and the disease as they relate to water supplies. Sessions on the organism, the disease, epidemiology, detection methodology, water treatment technology, and research needs were held. The proceedings consist of 19 invited manuscripts, 6 abstracts of contributed papers and transcripts of discussions following each presentation.

SAND-79-8210 PC **A03**/MF **A01**
Sandia Labs., Livermore, CA.
Carbon Particulate Measurements in a Diesel Engine.
S. C. Keeton. Jun 79, 42p
Contract EY-76-C-04-0789

Descriptors: *Diesel engines, *Soot, Exhaust gases, Measuring instruments, Measuring methods, *Particle size.
Identifiers: ERDA/330102, ERDA/330705, Light scattering, Concentration(Composition), *Air pollution.

For abstract, see ERA citation 04:045035.

TID-29425(V.1) PC **A05**/MF **A01**
Argonne National Lab., IL.
Assessment of National Consequences of Increased Coal Utilization. Executive Summary.
Feb 79, 89p

Descriptors: *Air pollution, *Boilers, *Fossil-fuel power plants, *Sulfates, *Sulfur dioxide, Air quality, Availability, Coal mining, Economics, Environmental effects, Environmental transport, Health hazards, National energy plan, Particles, Site selection, Socio-economic factors, Solid wastes, Waste disposal, Water, Water quality.
Identifiers: ERDA/010900, ERDA/294001, ERDA/290300, ERDA/500200, Electric power plants, State implementation plan, *Coal-fired power plants, Industril hygiene

For abstract, see ERA citation 04:038094.

UCRL-50042-78 PC **A04**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Annual Report of Lawrence Livermore Laboratory to the FAA on the High Altitude Pollution Program, 1978.
F. M. Luther. 30 Sep 78, 54p
Contract W-7405-ENG-48

Descriptors: *Stratosphere, *Air pollution, Chemical reactions, Chlorinated aliphatic hydrocarbons, Chlorine, Chlorine oxides, Environmental transport, Exhaust gases, Experimental data, Graphs, Hydrocarbons, Hydrogen peroxide, Hydroxyl radicals, Methane, Nitrogen oxides, Ozone, Photochemical oxidants, Quantity ratio, Solar cycle, Supersonic transport, Trace amounts.
Identifiers: ERDA/500200, High altitudes, *Mathematical models.

For abstract, see ERA citation 04:043741.

UCRL-51444-78 PC **A05**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Program Report for FY 1978: Atmospheric and Geophysical Sciences Division of the Physics Department.
J. B. Knox, and R. C. Orphan. Dec 78, 76p
Contract W-7405-ENG-48

Descriptors: *Earth atmosphere, *Pollution, *Radioactive wastes, Air pollution, Climates, Functional models, Lawrence livermore laboratory, Meteorology, Regulations, Research programs, Scavenging, Simulation.
Identifiers: ERDA/500200, ERDA/500300, ERDA/580200.

For abstract, see ERA citation 04:045356.

UCRL-52683 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Northern California Power Association-Shell Oil Company Geothermal Project No. 2: Noise Effects.
K. C. Lamson. Feb 79, 29p
Contract W-7405-ENG-48

Descriptors: *Geothermal power plants, *Geothermal wells, Geysers Geothermal Field, KGRA, *Noise pollution, Noise pollution control, Power range 100-1000 mw, Well drilling.
Identifiers: ERDA/150600.

For abstract, see ERA citation 04:042798.

13C. Construction Equipment Materials, and Supplies

AD-A070 643/2GA PC **A06**/MF **A01**
PMB Systems Engineering Inc San Francisco CA
Failure Criteria for Reinforced Concrete Structures. Volume I. Literature Survey and Proposed Analytical Models.
Final rept.,
Richard W. Litton, and Jawahar M. Gidwani. May 79, 123p AFWL-TR-77-239-VOL-1
Contract F29601-76-C-0135
See also Volume 2, AD-A070 644.

Descriptors: *Reinforced concrete, Structural engineering, *Failure(Mechanics), Mathematical models, Static loads, Dynamic loads, Biaxial stresses, Triaxial stresses, Stress strain relations, Cyclic rate, Elastic properties.

This literature summary reviews experimental and analytical studies relevant to the Theoretical Investigation of Failure Criteria for Reinforced Concrete Structures. An extensive list of relevant references used in this survey is also presented. (Author)

AD-A070 953/5GA PC **A05**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Conductive Flooring for Munitions Facilities.
Final rept. Sep 76-Aug 78,
Peter J. Hearst. Jun 79, 78p Rept no. CEL-TR-872
Contract MIPR-W52P1J7TC725

Descriptors: *Floors, *Electrical conductivity, Munitions industry, Ordnance laboratories, Magazines(Ordnance), Construction materials, Floor coverings, Coatings, Metals, Sheets, Concrete, Organic materials, Electrical properties.
Identifiers: *Conductive flooring.

Information is presented for use as guidelines in the selection of conductive flooring for munitions facilities. Available conductive floorings are described in the categories of concretes, organic composition toppings, coatings, coverings, and metal sheetings. Problems with conductive floorings and performance experiences at munitions facilities are discussed. Reconditioning, grounding, electrical resistance limits, and resistance measurement of conductive flooring also are discussed. (Author)

PB-298 752/7GA Not available NTIS
National Bureau of Standards, Washington, DC.
Composite Materials for Cryogenic Structures.
Final rept.,
M. B. Kasen. 1978, 11p
Sponsored in part by Department of Energy, Washington, DC.
Pub. in Proceedings Int. Cryogenic Materials Conf. (2nd), Held at Boulder, CO. on Aug 3-5, 1977. Paper A-5 in Advances in Cryogenic Engineering, v24 p63-73, 1978.

Descriptors: *Construction materials, *Composite materials, Cryogenics, Laminates, Concretes, Fiber composites.

Composite laminates and aggregates are already playing a significant role as structural materials in cryogenic technology. A much wider usage is anticipated as additional data and experience are obtained. Concretes, and to a certain extent industrial high-pressure laminates, will see increased usage in massive installations due to favorable cost factors. Some industrial laminates and low-pressure glass-reinforced laminates will serve for intermediate sized structures where their non-magnetic character and insulation qualities offer advantages over metallic structures. The high-modulus, low-pressure composites will see increasing usage as their cost decreases and as their cryogenic performance becomes better understood. The ability of such composites to match or exceed the strength and modulus of stainless steel suggests that their usage will substantially increase as alloy-

ing elements become scarce and more expensive. For the present, high-modulus composites will be selectively used for critical components where a nonmetallic, strong, stiff, low-thermal conductivity material is required to adequately perform specific critical tasks.

PB-298 835/0GA PC **A04**/MF **A01**
Transportation Research Board, Washington, DC.
Process Control in the Construction Industry,
Reid H. Brown, Frank P. Nichols, Jr., Jack H. Willenbrock, James C. Marcin, and Peter A. Kopac. 1978, 69p* TRB/TRR-691
Paper copy also available from Transportation Research Board, 2101 Constitution Ave., NW, Washington, DC. 20418, PC$3.60.

Descriptors: *Construction industry, *Process control, *Aggregates, Quality control, Quality assurance, Highways, Flexible pavements, Embankments, Excavation, Construction, Tests, Specifications.

The 11 papers in this report deal with the following areas: controlling the quality of construction aggregates through process control; process quality control in the crushed-stone industry; development of process control plans for quality assurance specifications; development of a highway construction acceptance plan; contractor control of asphalt pavement quality; equitable graduated pay schedules: an economic approach; construction industry response to a statistically based bituminous concrete specification in New Jersey; process control of mineral aggregates; probabilistic model of aggregate plant production systems; applicability of conventional test methods and material specifications to coal-associated waste aggregates; and implementation of quality assurance specifications for excavation and embankment construction in West Virginia.

13E. Couplings, Fittings, Fasteners, and Joints

RFP-2837 PC **A02**/MF **A01**
Atomics International Div., Golden, CO. Rocky Flats Plant.
Carbide Precipitation in the Heat Affected Zone of a GTA Weld in 21-6-9 Stainless Steel.
M. J. Carr, and W. G. Thorvaldson. 14 May 79, 13p
Contract EY-76-C-04-0789

Descriptors: Copper sulfides, Hydrogen sulfides, *Stainless steels, *Welded joints, Carbides, Corrosion, Corrosive effects, Gas tungsten-arc welding, Grain boundaries, Heat affected zone, Precipitation, Thermal cycling.
Identifiers: ERDA/360101, ERDA/360105, Steel 21-6-9.

For abstract, see ERA citation 04:043386.

13F. Ground Transportation Equipment

DOE/CS-0026-6 PC **A02**/MF **A01**
Department of Energy, Washington, DC.
Electric and Hybrid Vehicle Program. Quarterly Report, April–June.
May 79, 24p

Descriptors: *Electric-powered vehicles, *Hybrid electric-powered vehicles, Manufacturing, Market, Performance testing, Research programs.
Identifiers: ERDA/330300, ERDA/330400.

For abstract, see ERA citation 04:045080.

PB-298 605/7GA PC **A03**/MF **A01**
National Engineering Lab. (NBS), Boulder, CO. Electromagnetic Technology Div.
Electromagnetic Interference (EMI) Radiative Measurements for Automotive Applications.
Technical note,
J. W. Adams, H. E. Taggart, M. Kanda, and J. Shafer. Jun 79, 49p* NBS-TN-1014
Sponsored in part by National Highway Traffic Safety Administration, Washington, DC.

Descriptors: *Electromagnetic interference, *Ground vehicles, Radio transmitters, Electromagnetic compatibility, Field strength, Measurement, Electromagnetic fields, Electronic control, Electric fields, Magnetic fields.
Identifiers: Near field.

This report describes the measured results of the electromagnetic (EM) environment encountered by three different-sized vehicles exposed to a selection of CB and mobile radio transmitters and broadcast stations. The vehicle in these situations is immersed in the near field of the radiating signals and the measured data is near-field data. This report gives measured data of electric and magnetic fields measured independently. The purpose of the report is to identify the EM environmental conditions under different circumstances in order to estimate EMC testing criteria for vehicles and their electronic systems.

PB-298 850/9GA PC **A04**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Modeling the In-Stop Torque Performance of Hydraulically-Actuated Truck Brakes.
Final rept. 1 Jul 77-15 Oct 78,
T. Gillespie, L. Johnson, and P. Fancher. Dec 78, 51p UM-HSRI-78-58

Descriptors: *Trucks, *Hydraulic brakes, Effectiveness, Evaluation, Mathematical models, Torque, Braking, Performance, Brake drums, Brake linings, Regression analysis, Safety, Standards.
Identifiers: Federal motor vehicle safety standards, Safety standards, Safety standard 105.

The characteristics of two truck rear-axle hydraulic brakes with different linings are determined from mobile dynamometer tests and are modeled by a regression analysis relating the brake effectiveness to actuation force, sliding velocity, and drum/lining interface temperature. A finite element heat transfer model is used to determine the interface temperature. A multinomial expression involving 27 regression coefficients for one brake and 36 regression coefficients for the other brake is found sufficient to characterize these brakes with high coefficients of determination. The regression model for one brake, developed from test data acquired on the constant-speed mobile dynamometer, is used to predict the earlier performance of that same brake on an inertia dynamometer. Though the agreement obtained generally demonstrates the capability of the model at predicting in-stop torque performance, errors due to effectiveness changes caused by work history are evident. Practical applications of the brake model for predicting FMVSS 105 stopping distance performance and other uses are discussed.

PB-298 852/5GA PC **A04**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Tinted Windshield Involvement Among CPIR Accidents.
Final rept. Mar-Apr 79,
Lyle D. Filkins. Apr 79, 53p UM-HSRI-79-16
Sponsored in part by Libbey-Owens-Ford Co., Toledo, OH. Technical Center.

Descriptors: *Automobiles, *Windshields, *Motor vehicle accidents, Colors(Materials), Regression analysis, Records.
Identifiers: Accident causes.

The 9222 vehicles in the CPIR3 data set were examined for evidence that would indicate whether tinted windshields cause or prevent accidents. Windshield-tint condition was known for 4185 vehicles, and these were almost evenly split between clear and tinted windshields. The proportions of tinted windshields among these accident vehicles were smaller than those for U.S.-produced vehicles of comparable model years. Weighted least squares regressions showed that the proportion of drivers having tinted windshields increases as age increases, but that there are no statistically significant differences between daytime and nighttime conditions. It was concluded from the regression analyses that the data do not support the hypothesis that older drivers are negatively influenced at night with tinted windshields. It was also found that tinted windshields are associated with a variety of driver and vehicular variables believed to influence accident risk. Because of these uncontrolled, confounding variables, and because of methodological limitations associated directly with the CPIR file, it is not possible to isolate the influence of windshield tinting in accident causation or prevention.

PB-298 859/0GA PC **A04**/MF **A01**
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Validation of the MVMA/HSRI Phase II Straight Truck Directional Response Simulation. Motor Truck Braking and Handling Performance Study.
Final technical rept.,
Thomas D. Gillespie. Oct 78, 62p UM-HSRI-78-46

Descriptors: *Trucks, Dynamic response, Maneuverability, Stability, Computerized simulation, Loads(Forces), Steering, Braking, Motor vehicles, Tractors, Trailers.
Identifiers: Vehicle handling, Cornering, Turning.

Validation tests of the MVMA/HSRI straight truck directional response computer simulation program were conducted. A three-axle straight truck was instrumented and operated through test maneuvers both empty and loaded to 44,500 lb gross vehicle weight. Constant radius, steady-state cornering tests were run over a range of speeds up to limit cornering levels. Step-steer transient tests to beyond the vehicle stability limit were also performed. Computer simulations of the test maneuvers were compared against the measured response of the test vehicle. The simulation exhibited good agreement with the experimental results in prediction of low-speed cornering, understeer characteristics and transient response. Disparities in the validation due to lack of tire relaxation length and steering system compliance models in the computer simulation were noted.

PB-298 860/8GA PC **A11**/MF **A01**
Corporate-Tech Planning, Inc., Waltham, MA.
Weight Study - 1978 Chrysler Omni.
Final rept. Jul-Aug 78,
Norman F. Ludtke. Sep 78, 244p DOT-HS-804 720
Contract DOT-HS-7-01789
Prepared by Pioneer Engineering and Mfg. Co., Inc., Warren, MI.

Descriptors: *Automobiles, *Weight measurement, Components, Materials, Manufacturing, Structural design.
Identifiers: Chrysler Omni automobiles, Motor vehicles(1978 models), Fuel economy.

The study covers the results of a weight study on a standard 1978 4-door hatchback Chrysler Omni. All components were disassembled, weighed, photographed, analyzed for material and the manufacturing process determined. The objective of the study was to develop baseline data on automobile material usage, structural design and weights for use in future studies relative to improvements in fuel economy for the automobiles of the 1980's.

PB-298 933/3GA PC **A06**/MF **A01**
National Highway Traffic Safety Administration, Washington, DC. Technical Services Div.
Automobile Fuel Tanks.
Subject bibliography,
Lois Flynn. May 79, 102p* DOT-HS-804 728, SB-33

Descriptors: *Automobiles, *Fuel tanks, *Fuel systems, *Bibliographies, Crash research, Exhaust emissions, Accident investigations, Safety engineering, Motor vehicle accidents, Air pollution control, Abstracts.
Identifiers: *Crashworthiness.

This bibliography represents literature acquired since the establishment of the National Highway Traffic Safety Administration (NHTSA) and concerns automobile fuel tanks and fuel tank systems. It is comprised of NHTSA contract reports, reports of other organizations concerned with highway safety, and articles from periodicals in related fields.

UCRL-52553(V.1) PC **A04**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.

Energy Storage Systems for Automobile Propulsion: 1978 Study. 1. Overview and Findings.
C. J. Berhrin, C. J. Anderson, H. Bomelburg, M. Farahat, and H. C. Forsberg. 15 Dec 78, 57p
Contract W-7405-ENG-48

Descriptors: *Automobiles, *Energy storage systems, Capacity, Comparative evaluations, Cost, Data compilation, Economics, Electric-powered vehicles, Energy policy, Evaluation, Forecasting, Graphs, Hydrogen storage, Internal combustion engines, Market, Risk assessment, Safety, Systems analysis, Tables.
Identifiers: ERDA/330000, ERDA/290700, ERDA/250000.

For abstract, see ERA citation 04:041179.

13G. Hydraulic and Pneumatic Equipment

N79-28590/4GA PC **A07**/MF **A01**
Research Inst. of National Defence, Stockholm (Sweden).
Hydraulic Servo with Pulse Modulated Valves Hydraulservo Med Pulsmodulerade Ventiler.
A. Sjoequist. Jun 78, 136p FOA-C-20244-E3
Language in Swedish.

Descriptors: *Hydraulic equipment, Pulse modulation, *Servocontrol, *Servomotors, Control theory, Pneumatic equipment, Valves.

For abstract, see STAR 1719

N79-28591/2GA PC **A04**/MF **A01**
Research Inst. of National Defence, Stockholm (Sweden).
Undersoekning AV Laeges - och Hastighetsripple Hos Ett Fluidservo Med Pulsmodulerade Saetesventiler (Investigation of Position and Velocity Ripple in a Fluid Servo with Pulse Modulated Seat Valves),
A. Sjoequist. Jun 78, 56p FOA-C-20245-E3
Subm-Sponsored Partly by Swed. Board for Tech. Develop., Stal-Laval Turbin Ab, and Saab-Scania.
Language in Swedish.

Descriptors: *Computerized simulation, *Pulse position modulation, *Ripples, *Servomechanisms, *Valves, *Velocity, Control, Frequency modulation, Graphs (Charts), Hydraulic equipment, Pulse duration modulation, Pulse modulation, Pulse rate, Systems analysis, Tables (Data).

For abstract, see STAR 1719

13H. Industrial Processes

AD-A070 913/9GA PC **A05**/MF **A01**
Michigan Technological Univ Houghton Dept of Mechanical Engineering
Machining Powder Metallurgy Materials.
Final technical rept.,
C. H. Kahng. Sep 78, 87p SARRI-EN-TR-78-03
Contract DAAA09-74-C-2062

Descriptors: *Powder metallurgy, *Powder metals, *Machining, *Low alloy steels, Cutting, Drilling, Wear, Machine tools, Machinability, Reamers.
Identifiers: Steel 4140.

Powder metallurgy (P/M) products eliminate the need for most machining; however, many P/M Components do require some machining and little is known about the machinability of these materials. Toward providing guidelines for machining P/M materials, machining tests were conducted on low and high density P/M steel (AISI 4640) specimens. Results of these tests are presented along with data on conventionally wrought AISI 4140 steel. The preference for low alloy steels in the manufacture of weapon components led to the choice of these materials for the investigation. Significant differences in cutting forces were experienced in the cutting of high and low density P/M materials. The maximum practical cutting speed in drilling was higher for low density P/M material than that for high density material. Tool wear in the reaming of P/M materials was negligible. In drilling, improvement of hole geometry by sequential machining operations varied greatly. Boring with a rigid bar gave the best geometry. Hardness of the material had decisive effect on machinability. Relatively burr-free holes could be drilled in P/M materials. Overall machinability of the investigated materials did not show significant differences. (Author)

GEPP-342 MF **A01**
General Electric Co., St. Petersburg, FL. Neutron Devices Dept.
Microprocessor Applications.
T. A. Wedel. 1977, 35p CONF-7710181-1
Contract EY-76-C-04-0656
Test methodology information exchange program conference, Kansas City, MO, USA, 11 Oct 1977, Portions of document are illegible.
Microfiche copies only.

Descriptors: *Microprocessors, *Process control, Control systems, Performance, Specifications, Uses.
Identifiers: ERDA/990200, Computer applications, Temperature control, Vacuum apparatus, Vacuum heating, Drilling, Machining, Glass, Manufacturing.

For abstract, see ERA citation 04:044175.

NTIS/PS-79/0890/8GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Laser Cutting and Machining: Metals (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 79,
Guy E. Habercom, Jr. Sep 79, 282p*
Supersedes NTIS/PS-78/0852 and NTIS/PS-77/0722.

Descriptors: *Bibliographies, *Lasers, *Cutting tools, Metal cutting, Machining, Metal finishing, Laser beams, Thermal analysis, Abstracts.
Identifiers: *Laser applications.

Techniques for metalworking, machining, and cutting by use of controlled laser beams are investigated in these reports gathered in worldwide literature surveys. Precision finishing of metal surfaces is described. The thermal response of various metals is evaluated. (This updated bibliography contains 275 abstracts, 23 of which are new entries to the previous edition.)

NTIS/PS-79/0891/6GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Laser Cutting and Machining: Nonmetals (Citations from the Engineering Index Data Base).
Rept. for 1970-Jul 79,
Guy E. Habercom, Jr. Sep 79, 136p*
Supersedes NTIS/PS-78/0853 and NTIS/PS-77/0723.

Descriptors: *Bibliographies, *Lasers, *Cutting tools, Nonmetals, Glass, Wood, Fabrics, Plastics, Machining, Cutting, Laser beams, Thermal analysis, Abstracts.
Identifiers: *Laser machining, *Laser applications.

Techniques for electrothermal cutting and machining of glass, fabrics, wood, plastics, and other nonmetal products by use of controlled laser beams are described in these reports gathered in worldwide literature surveys. Thermal analyses of materials exposed to laser beams are investigated. (This updated bibliography contains 130 abstracts, 15 of which are new entries to the previous edition.)

PB-298 643/8GA PC **A03**/MF **A01**
Department of Agriculture, Washington, DC.
Industrias Quimica S.A. A Proposed Plant to Produce Sulphuric Acid in Panama,
Morris Solomon. 19 Apr 63, 45p
Sponsored in part by Agency for International Development, Washington, DC.

Descriptors: *Industrial plants, *Panama, *Manufacturing, *Sulfuric acid, Requirements, Production management, Operating costs, Materials estimates, Equipment, Market surveys, Financial management, Cost estimates, Labor estimates.
Identifiers: Developing country application.

The brochure takes into account the domestic consideration, nature and state of the market in Panama. Then it proceeds to delve into the building of a sulphuric acid plant citing land cost, building, furniture, insurance working capital, taxes, maintenance, labor, etc. Numerous charts given at the back of the work show a breakdown in every phase of the project.

PB-298 838/4GA PC **A02**/MF **A01**
Swedish International Development Authority, Stockholm.
International Forum on Appropriate Industrial Technology Held at New Delhi/Anand, India on November 20-30, 1978. Lime Burning and Alkaline Pulping.
Background paper,
J. Leffler. 3 Oct 78, 23p
Report of Working Group No. 10, Appropriate Technology for the Manufacture of Pulp and Paper Products. Sponsored in part by Agency for International Development, Washington, DC., and United Nations Industrial Development Organization, Vienna (Austria).

Descriptors: *Manufacturing, *Calcium oxides, *Pulp mills, Sulfates, Sodium inorganic compounds, Bamboo, Cost estimates, Consumption, Kilns, Requirements, Developing countries, Rural areas, Paper products, Pulping.
Identifiers: Developing country application, Lime.

The paper is divided into two parts. The first one describes the consideration taken in a particular case to choose an appropriate installation for lime burning in a developing country in connection with an alkaline sulphate pulp mill based on bamboo. The mill site is situated in a rural area of the country, which is intended to be industrialized. The second part gives some cost estimates, consumption, and efficiency figures covering lime kilns in general. As the prerequisites in this case study mainly differ from the situation if wood is the fibre raw material, if the infra-structure and technical experience have been well established for long time, etc., the choice of lime burning cannot be conventional. The paper is based on own experiences and information and advice which the author has gotten from textbooks, other technical reports and brochures and also valuable discussions with lime kiln manufacturers, lime producers, and pulp producers.

PB-298 840/0GA PC **A03**/MF **A01**
United Nations Industrial Development Organization, Vienna (Austria).
International Forum on Appropriate Industrial Technology Held at New Delhi/Anand, India on November 20-30, 1978. Appropriate Industrial Technology Application in the Pulp and Paper Industry in the Philippines.
Background paper,
J. O. Escolano, and F. N. Tamolang. 4 Oct 78, 29p
Report of Working Group No. 10, Appropriate Technology for the Manufacture of Pulp and Paper Products. Sponsored in part by Agency for International Development, Washington, DC.

Descriptors: *Manufacturing, *Paper products, *Pulps, Pulping, Hardwoods, Pulp mills, Paper making, Paper industry, Developing countries, Philippines.
Identifiers: Developing country application.

Pulp and paper research and development work conducted at the Forest Products Research and Industries Development Commission (FORPRIDECON), Philippines during the past years have shown the technical feasibility of using indigenous materials (not only from traditional but also from non-conventional sources), for the production of different types of pulp and paper products, using suitable pulping processes. Practical experience in the Philippines has also demonstrated that appropriate technologies can be successfully applied in commercial operations both in the categories of small pulp mills and large-scale activities, depending on the raw materials used.

PB-298 841/8GA PC **A99**/MF **A01**
Environmental Protection Agency, Washington, DC. Office of Toxic Substances.
Proceedings of the Workshop on Alternatives for Cadmium Electroplating in Metal Finishing Held at National Bureau of Standards, Gaithersburg, Maryland on October 4-6, 1977,
Elbert Dage, Edward Dyckman, William Isler, and Fielding Ogburn. Mar 79, 634p EPA/560/2-79/003
Sponsored in part by Consumer Product Safety Commission, Washington, DC., Department of

Commerce, Washington, DC., Department of Defense, Washington, DC., and Department of Health, Education, and Welfare, Washington, DC.

Descriptors: *Metal finishing, *Meetings, Electroplating, Substitutes, Plating, Cadmium, Zinc, Tin, Aluminum, Water pollution control, Waste treatment, Protective coatings.

The publication compiles the proceedings of the Workshop on Alternatives for Cadmium Electroplating in Metal Finishing held October 4-6, 1977 which was jointly sponsored by seven Federal agencies. The workshop was prompted by the concerns of government agencies for the potential environmental damage resulting from current cadmium electroplating practices and the high rate of government use of electrodeposited cadmium. The workshop examined techniques and alternatives to minimize the environmental losses of cadmium from electroplating by (a) applying cadmium by mechanisms that reduce the loss of cadmium during plating and (b) developing suitable and cost-effective alternative materials, methods, and coatings. The workshop included presentations on the Federal and industrial concerns for the commercial significance, environmental effects, and health effects of cadmium. Panel discussions reviewed the topics 'Are specifications and standards barriers to change' and 'How essential is electrodeposited cadmium'.

PB-298 846/7GA PC **A04**/MF **A01**
United National Industrial Development Organization, Vienna (Austria).
International Forum on Appropriate Industrial Technology Held at New Delhi/Anand, India on November 20-30, 1978. Appropriate Technology in Production of Cane Sugar.
Background paper,
B. A. Bhat, and F. Duguid. 29 Sep 78, 61p
Report of Working Group No. 4, Appropriate Technology for the Production of Sugar. Sponsored in part by Agency for International Development, Washington, DC.

Descriptors: *Manufacturing, *Sugars, Developing countries, Consumption, Statistical data, Sugarcane, Production methods, Machinery, Employment, Molasses, Industries, Profits.
Identifiers: Sugar industry, Developing country application.

Described in this paper are alternative sugar production processes, products and their by-products. Some production, trade and consumption statistics to illustrate the likely future importance in the industrialization policies of many LDC's are also included. A brief discussion considers the more important agricultural aspects of sugar cane production, emphasizing the necessarily close relationship with factory operations. Identified are alternative techniques at each major sub-process for two technology types--open-pan and vacuum pan. Briefly discussed are sources of equipment for both technologies. An evaluation is given of a number of alternative technologies based on stated assumptions on season length, operating parameters and cost data. Relevant policy implications and options are presented. An appendix offers a list of suppliers of turnkey packages and specialist equipment for both small-and large-scale technologies and a number of consulting firms.

PB-298 863/2GA PC **A04**/MF **A01**
United National Industrial Development Organization, Vienna (Austria).
International Forum on Appropriate Industrial Technology Held at New Delhi/Anand, India on November 20-30, 1978. Cane Sugar Techniques in Developing Countries.
Background paper,
J. M. Paturau. 2 Oct 78, 67p
Report of Working Group No. 4, Appropriate Technology for the Production of Sugar. Sponsored in part by Agency for International Development, Washington, DC.

Descriptors: *Sugars, *Manufacturing, Sugarcane, Production methods, Economic development, Technology innovation, Tropical regions, Sugar crops, Industrial plants, Developing countries, Mauritius.
Identifiers: Developing country application, Sugar industry.

The main physical constraints of cane sugar production are briefly described and the sugar production objectives to ensure socio-economic development are considered. Alternative methods of production are compared and possible solutions for the more efficient development recommended. Consideration is given to various technical improvements that would ensure greatly improved results. Cane sugar production is considered an appropriate production for tropical and semi-tropical Third World countries. Some of the main socio-economic data of the Mauritius sugar industry are given to serve as guidelines.

PB-299 024/0GA PC **A06**/MF **A01**
Westinghouse Research and Development Center, Pittsburgh, PA.
Programmable Assembly Research Technology Transfer to Industry - Phase 2.
Quarterly rept. no. 1,
R. G. Abraham, R. J. S. Stewart, T. Csakvary, L. Y. Shum, and C. Ho. 31 Mar 79, 101p NSF/RA-790070
Grant NSF-ISP78-18773
See also report dated 1976, PB-285 885.

Descriptors: *Assembly lines, *Automation, *Production engineering, Technology transfer, Assembling, Manufacturing, Robots, Manipulators, Automatic control equipment, Adaptive systems.
Identifiers: Computer applications, Adaptable programmable assembly systems, Programmable automatic assembly, APAS systems.

The adaptable-programmable assembly system (APAS) pilot line conceptual design of Phase 1 has been modified because of longer cycle times of commercially available robots and the identification of more assembly operations and motor part variations. An in-line, power-and-free, buffered transfer system concept is used now for both end bell and final assembly. Computer and control system requirements were determined for the supervisory, vision, path control, and sequence control subsystems. High risk portions of the APAS pilot system are identified and experiments planned. Vision system experimentation has demonstrated that image processing execution time is well within the 1.5 second time goal needed to achieve the overall 15 second motor assembly cycle time.

RFP-2838 PC **A02**/MF **A01**
Atomics International Div., Golden, CO. Rocky Flats Plant.
Abbreviated Machining Schedule for Fabricating Beryllium Parts Free of Surface Damage.
S. Beitscher, J. F. Capes, W. W. Leslie, J. R. Luckow, and R. L. Riegel. 18 May 79, 25p
Contract EY-76-C-04-3533

Descriptors: *Beryllium, Nuclear weapons, Chemical composition, Damage, Fabrication, Hot pressing, *Machining, Mechanical properties, Mechanical structures, Nondestructive testing, Powders, Stresses, Surfaces.
Identifiers: ERDA/360101, ERDA/400202.

For abstract, see ERA citation 04:043387.

SAND-78-0223C PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Effect of Surface Contamination on Solid Phase Welding: An Overview.
J. L. Jellison. 1978, 26p CONF-7806124-1
Contract EY-76-C-04-0789
Symposium on surface contamination, Hamilton, Ontario, Canada, 2 Jun 1978.

Descriptors: Metals, *Welding, Adhesion, Films, Impurities, Surface contamination, Welded joints.
Identifiers: ERDA/360103.

For abstract, see ERA citation 04:034185.

Y/DA-8211 PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Lasers in Machine Tool Controls.
R. R. Burleson. Apr 79, 9p CONF-790639-1
Contract W-7405-ENG-26
43. Westinghouse annual machine tool forum, Pittsburgh, PA, USA, 4 Jun 1979.

Descriptors: *Machine tools, Accuracy, Control systems, Errors, Fabrication, Interferometers, Lasers, Mirrors, Transducers.
Identifiers: ERDA/420200, ERDA/700208, ERDA/420300, Laser applications.

For abstract, see ERA citation 04:043590.

Y/DA-8297 PC **A02**/MF **A01**
Oak Ridge Y-12 Plant, TN.
Computer Aided Process Planning at the Oak Ridge Y-12 Plant: A Pilot Project.
R. E. Hewgley, Jr., and H. P. Prewett, Jr. 19 Apr 79, 12p CONF-790534-1
Contract W-7405-ENG-48
Annual TNO users meeting, Arlington, TX, USA, 2 May 1979.

Descriptors: *Machining, Automation, Planning, Y-12 plant.
Identifiers: ERDA/420200, Production planning.

For abstract, see ERA citation 04:043591.

13I. Machinery and Tools

AD-A070 631/7GA PC **A04**/MF **A01**
Norton Co Worcester MA Industrial Ceramics Div
Investigation of the Use of Ceramic Material in Aircraft Engine Bearings.
Final rept. 14 Jun 76-19 Dec 78,
John W. Lucek, and Paul E. Cowley. Jun 79, 58p
Contract N00019-76-C-0251
Prepared in cooperation with Federal Mogul Corp., Ann Arbor, MI. Errata sheet inserted.

Descriptors: *Roller bearings, *Aircraft engines, *Ceramic materials, *Silicon nitrides, Steel, Hot pressing, Hybrid systems, Tools, Test methods, Surface finishing, Machining, Fracture(Mechanics), Tracer studies.
Identifiers: Steel M-50.

A program to initiate life factor correlation between hot-presded silicon nitride rolling elements and M-50 steel hybrid rolling elements has been completed. All materials for component fabrication have been procured and qualified. Retainers and test tooling are complete. Complications in rolling contact fatigue qualification of roller stock, traced to specimen preparation techniques did not allow completion of bearing fabrication. A considerable effort was dedicated to study of the RCF qualification for ceramic materials resulting in development of machining techniques to produce bearing quality silicon nitride surfaces without super-finishining. Static Hertzian indentation of silicon nitride surfaces, fracture energy measurements, and radioactive gas penetrant tracers were found to be potentially valuable evaluation techniques for ceramics in the rolling contact environment. (Author)

AD-A070 708/3GA PC **A03**/MF **A01**
Naval Research Lab Washington DC
Solvent Cleaning Effects on Miniature Bearing Steel Surfaces.
Interim rept. Oct 77-Jan 79,
Marianne K. Bernett, Barbara J. Kinzig, James S. Murday, and Harold Ravner. 14 Jun 79, 48p Rept no. NRL-MR-4011

Descriptors: *Bearings, *Steel, *Surface properties, Precision finishing, Cleaning compounds, Solvents, Miniaturization, Contaminants, Instrumentation, Auger electron spectroscopy, X ray photoelectron spectroscopy, Infrared radiation, Wetting.
Identifiers: Steel 52100, Steel 440-C.

Traces of surface contaminants on precision miniature instrument bearings in guidance and other critical systems and greatly contribute to the ultimate failure of such systems. Current solvent-cleaning procedures employed by Navy facilities to prepare bearings for for assembly vary with respect to materials and methods, but the specific effects of these variations on the bearing surfaces are unknown. To critically examine these effects, reference surfaces of specially cleaned 52100 and 440C bearing steels were characterized at NRL by Auger electron and X-ray photo-electron spectroscopic analysis, and by wettability and infrared studies; they were then subjected to standard sequential cleaning cycles and to individual solvents at several Navy facilities, and re-examined at NRL by the same techniques. The data indicated that various quantities of hydrocarbon, ester, and other residues were deposited during the cleaning process on the reference surfaces. The results are dis-

cussed in terms of comparisons of the types, levels, and probable origins of the contaminants, and their implications regarding bearing life and reliability. (Author)

N79-28286/9GA PC **A07**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
The Effect of Brinelling and Fretting Fatigue on the Fatigue Life of Assembled Machine Components.
L. Kreitner. Feb 79, 135p RAE-LIB-TRANS-1998, BR68838
Tran-Transl. Into English of "Die Auswirkung von Reibkorrosion und von Reibdauerbeanspruchung Auf die Dauerhaltbarkeit Zusammengesetzter Maschinenteile" Forschungshefte Forschungskuratorium Maschinenbau E.V., Frankfurt, Pt. 56, 1976.

Descriptors: *Component reliability, *Fatigue tests, *Fretting corrosion, *Metal fatigue, *Steels, *Titanium alloys, Cracking (Fracturing), Heat treatment, Loads (Forces), Lubricants, Sliding friction, Stress concentration.
Identifiers: Translations.

For abstract, see STAR 1719

N79-28371/9GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
SRB-TPS Spray Nozzle Development for MSA-1 Application.
W. P. Prasthofer. Jun 79, 36p NASA-TM-78231

Descriptors: Nozzle design, Protective coatings, *Spray nozzles, Ablative materials, Corrosion resistance, Ocean surface, Sprayed coatings, Thermal control coatings.

For abstract, see STAR 1719

PATENT-4 135 412
Not available NTIS
Department of Energy, Washington, DC.
Backlash Compensator Mechanism.
Patent,
J. L. Chrislock. Filed 14 Dec 77, patented 23 Jan 79, 4p PAT-APPL-860 654
Supersedes PAT-APPL-860 654-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Machine tools, Control equipment, Design.
Identifiers: ERDA/420200, *Patents, Position indicators, Errors, Compensation.

For abstract, see ERA citation 04:043592.

13J. Marine Engineering

AD-A070 535/0GA PC **A20**/MF **A01**
Naval Undersea Center San Diego CA
Acrylic Plastic Viewpoint for Ocean Engineering Applications. Volume I.
Research rept.,
J. D. Stachiw. Feb 77, 459p Rept no. NUC-TP-562-VOL-1
See also Appendices, AD-A070 537 and Volume 2, AD-A070 536.

Descriptors: *Acrylic resins, *Windows, *Pressure vessels, *Submersibles, Spheres, Structural analysis, Structural Properties, Marine engineering, Optical materials, Optical properties, Fouling, Weathering, Ocean environments, Fatigue life, Fatigue tests(Mechanics), Specifications, Quality control.

For safe performance, viewpoints in pressure vessels for human occupancy require windows that are designed according to conservative engineering principles and fabricated from optical material with proven structural properties. This design handbook presents to the prospective viewport designer a succinct summary of existing data and recommended guidelines for using these data in the design, fabrication, and acceptance testing of acrylic plastic windows. Guidelines are presented for windows operating in the range of -15 to +20,000 poundss per square inch and -40 to 151 F. By utilizing these guidelines a cyclic fatigue life of 10,000 cycles with 40,000 hours of sustained pressurization over a period of 10 years can be assured. Greater cyclic fatigue life or longer sustained loading durations can also be achieved, but the designer must develop design criteria whose safety factors exceed those incorporated in the design guidelines of this handbook. Specifications for acrylic plastic are given to ensure procurement of material whose performance will satisfy the structural, optical, and longevity criteria of this handbook. Samples of quality control forms are also included which, when filled completedly out, will constitute acceptable documentation for subsequent safety design review and certification procedures. (Author)

AD-A070 536/8GA PC **A19**/MF **A01**
Naval Undersea Center San Diego CA
Acrylic Plastic Viewpoints for Ocean Engineering Applications. Volume II.
Research rept.,
J. D. Stachiw. Feb 77, 441p Rept no. NUC-TP-562-VOL-2
See also Appendices, AD-A070 537, and Volume 1, AD-A070 535.

Descriptors: *Acrylic resins, *Windows, *Pressure vessels, *Submersibles, Shells(Structural forms), Spheres, Structural analysis, Structural properties, Marine engineering, Optical materials, Optical properties, Failure(Mechanics), Stress analysis, Fabrication.

No abstract available.

AD-A070 537/6GA PC **A09**/MF **A01**
Naval Undersea Center San Diego CA
Acrylic Plastic Viewports for Ocean Engineering Applications. Appendices.
Research rept.,
J. D. Stachiw. Feb 77, 189p Rept no. NUC-TP-562-APP
Appendices to Volume 1, AD-A070 235. Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: Acrylic resins, *Windows, *Pressure vessels, *Submersibles, Spheres, Shells(Structural forms), Frustums, Construction, High pressure, Displacement, Deformation, Loads(Forces).

No abstract available.

AD-A070 570/7GA PC **A02**/MF **A01**
Naval Coastal Systems Center Panama City FL
Underwater Nondestructive Testing Equipment and Techniques,
Fred Barrett, and John Mittleman. 1979, 22p
Presented at the International Diving Symposium Held in New Orleans, LA on 5-7 Feb 79.

Descriptors: Nondestructive testing, *Underwater equipment, *Ship hulls, Test equipment, Inspection, Stereophotography, Ultrasonic tests, Thickness, Underwater, Detection, Magnetic detection, Defects(Materials), Cracks, Measurement.

Aimed at producing hardware for ship hull inspections, this project focused on stereophotography, ultrasonic thickness gaging and flaw detection, and magnetic particle inspections. In each case, hardware was chosen on the basis of an extensive survey of users and manufacturers both in America and Europe. Modification and adaptation of off-the-shelf equipment was performed at NCSC in order to arrive at systems easily used by U.S. Navy divers, and tests were run to determine the performance of each system under laboratory and field conditions. The stereophotography system described is an inexpensive unit which produced photogrphs of excellent quality in spite of zero visibility conditions. Corrosion pit depths or fouling heights can be measured to approximately + or - 1/64 inch, and incipient paint blistering can be detected before the blisters pop. The ultrasonic equipment described provides audible feedback to the diver to assist him in positioning the transducer. Also, thickness readings and flaw signal amplitudes can be stored on computer tape. The magnetic particle inspection systems include permanent record techniques such as magnetic rubber and transferring magnetic particles to a variety of putty-like materials.

AD-A070 856/0GA PC **A04**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Long-Term Holding Capacity of Statically Loaded Anchors in Cohesive Soils.
Technical note Jan 73-Jan 78,
R. M. Beard. Jan 79, 62p Rept no. CEL-TN-1545

Descriptors: *Anchors(Structural), *Ocean bottom, Soils, Cohesion, Static loads, Creep.
Identifiers: *Holding capacity.

The Civil Engineering Laboratory has conducted model anchor tests, intermediate scale field tests, laboratory soil investigations, and finite element analyses to optimize procedures for estimating long-term holding capacity of statically loaded plate-like anchors embedded in cohesive seafloor soils. Also, work was done to determine relationships between long- and short-term holding capacity. This report presents the results of these test and analyses. It is concluded that the long-term holding capacity in cohesive soils can be readily analyzed using drained strength parameters and holding capacity factors originally developed for cohesionless soils. It is also concluded that suction is an itegral part of short-term holding capacity and that it should not be ignored. Procedures for estimating both long- and short-term holding capacity are given, and design factors of safety are recommended. (Author)

AD-A070 859/4GA PC **A03**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
Drydock Certification.
Technical note Oct 77-Oct 78,
J. B. Forrest, and J. M. Ferritto. Mar 79, 46p Rept no. CEL-TN-1548

Descriptors: *Drydocks, Structural properties, Foundations(Structures), Soil mechanics, Ground water, Seepage, Hydrostatic pressure, Water flow, Computerized simulation, Finite element analysis, Drainage, Deformation.

No procedure is presently defined for reliably measuring the foundation condition of existing graving drydocks. Because of unknown or misunderstood soil and groundwater flow conditions, drydocks have not always continued to perform as designed. This report presents the initial year's effort of a longer term program to develop a systematic, defined evaluation routine for drydock foundations. The causes of a few previous drydock failures are discussed, and areas of potential difficulties are identified. Potential measuring devices and procedures for measurement are discussed briefly, and the need for advances in particular areas such as in void detection are noted. A brief review of available analytical computer models dealing with groundwater flow is presented. Those models considered most appropriate for treating the subsurface flow regime beneath a drydock have been selected for application. Attention is also directed toward available soil-structure interaction computer models, and some of their shortcomings or deficiencies are identified. This report singles out several critical categories for drydock analysis from a geotechnical viewpoint and recommends areas for further endeavor. (Author)

AD-A070 886/7GA PC **A06**/MF **A01**
Stevens Inst of Tech Hoboken NJ Davidson Lab
Added Mass and Damping of the Heaving Surface Effect Ship in Uniform Translation.
Final rept. Dec 76-Feb 78,
C. H. Kim, and S. Tsakonas. Dec 78, 104p Rept no. SIT-DL-78-9-2040
Contract N00014-77-C-0061

Descriptors: *Surface effect ships, *Ship motion, Water waves, Plenum chambers, Heaving, Damping, Hydrodynamics, Aerodynamic forces, Harmonics, Bubbles, Pressure distribution, Coefficients, Boundary value problems.
Identifiers: Added mass.

The analysis presents a practical method for evaluating the added mass and damping coefficients of a heaving surface effect ship in uniform translation. The theoretical added mass and damping coefficients and the heave response show fair agreement with the corresponding experimental values. Comparisons of the coupled aero-hydrodynamic and uncoupled analytical results with the experimental data prove that the uncoupled theory, dominant for a long time, that neglects the free surface effects is an over simplified procedure. The analysis also provides means of estimating

the wave elevation of the free surface, escape area at the stern and the volume which are induced by a heaving surface-effect ship in uniform translation in otherwise calm water. Computational procedures have been programmed in FORTRAN IV language and adapted to the PDP-10 high-speed digital computer. (Author)

AD-A070 892/5GA PC **A04**/MF **A01**
Casde Corp Torrance CA
User's Manual for Simulations of Man Overboard and Abandon Ship Casualties to Study Rescue Boat Performance.
Final rept. Nov 76-May 78,
L. B. Brown, R. M. DiJulio, F. J. Nickels, and R. Saucedo. May 78, 55p USCG-D-8-78
Contract DOT-CG-61276-A

Descriptors: Instruction manuals, User needs, *Sea rescues, Simulation, Standards, *Survival(General), Performance tests, Computer programs.
Identifiers: *Boats.

This report is a User's Manual which describes the usage of the Man Overboard and the Abandon Ship Simulations discussed in detail in Report No. CG-D-7.78. The simulations provide a means by which rescue boat performance criteria may be determined; they may also be used to evaluate known rescue boat characteristics. Both simulations have a standard use which allow the user to select a set of standard values to serve as a common base for variations in the rescue boat characteristics. The manual describes the usage of the standard simulation as well as the more flexible override mode. This latter mode is intended for the user who may want to investigate special conditions. The simulations provide a method for the user to override the standard values and substitute values of his own design. Separate sections in this report describe the override capability.

AD-A070 893/3GA PC **A06**/MF **A01**
Casde Corp Torrance CA
Programmer's Manual for Computer Programs Involved in a Study of Rescue Boat Performance for Selected Commercial Vessel Casualties.
Final rept. Nov 76-May 78,
L. B. Brown, R. M. DiJulio, F. J. Nickels, and R. Saucedo. May 78, 112p USCG-D-9-78
Contract DOT-CG-61276-A

Descriptors: Programming manuals, Computer programs, *Sea rescues, Performance tests, Boats, Casualties, Instruction manuals.
Identifiers: *Survival(General), Basic.

This volume presents the Programmer's Manual which describes the computer programs used to develop performance criteria for rescue boats involved in commercial vessel casualties. The casualties addressed are the Man Overboard and Abandon Ship for nine different types of casualties. Report No. CG-D-7-78 presents a detailed discussion of the overall study. Both simulations, i.e., the Man Overboard Simulation and the Abandon Ship Simulation, are written in BASIC. Both simulations are intended to run on a micro or minicomputer system and were specifically developed for use on a Wang 2200 System. (Author)

AD-A070 897/4GA PC **A08**/MF **A01**
Casde Corp Torrance CA
Study of Rescue Boat Performance for Selected Commercial Vessel Casualty Profiles.
Final rept. Nov 76-May 78,
L. B. Brown, R. M. DiJulio, F. J. Nickels, and R. Saucedo. May 78, 159p USCG-D-7-78
Contract DOT-CG-61276-A

Descriptors: *Rescue vehicles, *Sea rescues, Survival equipment, Performance tests, Crash rescue boats, Casualties, Computerized simulation, Operational effectiveness.

A methodology is developed in this study for determining functional performance criteria for survival systems in general; it is illlustrated , however, specifically for rescue boats. Casualty profiles are developed for rescue boats in man overboard and abandon ship casualties. The casualty profiles are presented as block diagrams. The rationale for each event and relationship contained in the casualty profiles is described. The casualty profiles are then developed into computer simulation programs. The Man Overboard Computer Simulation Model and the Abandon Ship Computer Simulation Model are both programmed in BASIC and designed to run on a Wang 2200 System; with minor modifications, they can be modified to run on any micro or minicomputer system. Effectiveness analyses of rescue boats were performed using both programs to determine the effect of seven rescue boat characteristics on the rescue rate. Tentative rescue boat criteria were derived from these analyses. Test procedures are proposed for determining the degree to which rescue boats meet the functional performance criteria.

AD-A071 146/5GA PC **A06**/MF **A01**
Stevens Inst of Tech Hoboken NJ Davidson Lab
Non-Linear Forces on Oscillating Plates: Review and Analysis of the Literature.
Final rept. 1 May 77-31 Dec 78,
J. F. Dalzell. Dec 78, 118p Rept no. SIT-DL-78-9-2031
Contract N00014-77-C-0370

Descriptors: *Ship motion, Oscillation, Hydrodynamics, Roll, Damping, Sea states, Degrees of freedom, Analysis of variance, Monte Carlo method, Fokker Planck equations.

The general objective of the present work was to look for alternatives to the conventional time domain model for the oscillatory forces on plates, using what data could be found in the literature. To the extent which information could be extracted from existing sources, an alternate to the conventional model can be synthesized, but only for sinusoidal plate or fluid motion. The results do not obviously point the way toward a real-time non-linear model suitable for more complex forms of motion. an approach for which there had been high initial hopes (the functional polynominal) appeared, at the end of the work, not to be so promising. (Author)

AD-A071 189/5GA PC **A06**/MF **A01**
Telephonics Corp Huntington NY
Engineering and Test Report United States Naval Applied Science Laboratory VDS Towline Flexing Facility.
Final rept.
1971, 116p
Contract N140(62462)77644B

Descriptors: *Towing cables, Fatigue tests(Mechanics), Cable assemblies, Cable fairings, Test equipment, Sheaves(Drives), Hydraulic equipment, Tensile testers, Flexural properties, Failure(Mechanics), Variable depth sonar, Towed sonar.
Identifiers: MOST project-4, AN/SQA-8.

The Towline Flexing Facility has been designed to demonstrate the VDS cable bending fatigue characteristics and reliability. This facility will also demonstrate working repeatability of faired and unfaired VDS tow cables under simulated tow conditions. The VDS towline flexing facility is capable of subjecting VDS towlines to controlled variable tensions while simultaneously driving this cable in a reciprocating motion around a driven sheave. The linear travel of the cable, under test, is adjustable within controlled and specified limits. To enable the test facility to handle various size cables, provisions have been made for the interchangeability of sheaves of various diameters, adapted to a standard type of hub. Cable cycling direction is automatically controlled by cam operated limit switches which are actuated by the drum rotation. These switches energize solenoid operated hydraulic directional control valves which control the direction of drum rotation. Cable tension is controlled and regulated by the hydraulic pressure setting of a relief valve and the 'head end' area of the hydraulic tensioning cylinders. Several protective safety devices are provided.

AD-A071 202/6GA PC **A06**/MF **A01**
Business and Technological Systems Inc Seabrook MD
Program Development to Study Faired Towlines.
Interim rept. 1 May 78-30 Apr 79,
J. B. Eades, Jr., and V. Majer. Jan 79, 121p BTS-TR-79-74, ONR-CR298-003-1
Contract N00014-78-C-0410

Descriptors: *Towing cables, *Hydrodynamics, Kiting, Structural analysis, Computer programs, Algorithms, Drag, Towed bodies, Structural properties, Naval research.
Identifiers: *Faired towlines, Hydrodynamic loading, HYDROSAP computer program.

A computer program has been developed to study the interactions beween hydrodynamic loading and structural response of flexible, faired, underwater towing cables. The equilibrium shape of the cable's cross-section when it is moving at an angle of attack in a steady two-dimensional viscous flow (Field) is computed. (Author)

PB-298 419-T/GA PC **A11**/MF **A01**
National Marine Fisheries Service, Washington, DC.
Design and Testing of TRAWLS,
A. L. Fridman, M. M. Rozenshten, and V. N. Lukashov. c1979, 226p TT-75-52014
Trans. of mono. Proektirovanie i Ispytanie Tralov, Moscow, 1973. Sponsored in part by National Science Foundation, Washington, DC. Special Foreign Currency Science Information Program.

Descriptors: *Boats, *Fishing, *Nets, Design, Specifications, Hydromechanics, Measuring instruments, Translations.
Identifiers: *Foreign technology, Trawlers, Fishing nets, Fishing industry, Similarity theory.

This book deals with the problems of design and testing of trawls-the principal equipment of modern fisheries. The method of trawl design presented here has been evolved and put into practice comparatively recently. The scientific basis of this method is the theory of similarity and dimension analysis which, these days, is being used in varying degrees for designing most engineering equipment, e.g. ships, aircraft, various machines and mechanisms. Therefore the book touches briefly upon the salient points of the theory of similarity as applicable to fishing gear. The book attempts to reflect fully the modern level of analysis of the problems of trawl design by generalizing the known data on these topics and using the results of the author's work at the Kaliningrad Technical Institute of Fishing Industry and Agriculture.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AD-A070 941/0GA PC **A05**/MF **A01**
Systems Science and Software La Jolla CA
Casing Leak Detection Study.
Final rept. Dec 77-Feb 79,
P. L. Lagus, and R. D. Broce. Jul 79, 78p SSS-R-79-3943, AFESC/ESL-TR-79-05
Contract F08635-78-C-0025

Descriptors: *Leak detectors, *Tracer studies, *Steam pipes, Trace gases, Gas chromatography, Diffusion, Sulfur compounds, Fluorides, Halogenated hydrocarbons.

The purpose of this study was to investigate the feasibility of using tracer gas technology to locate leaks in underground RIC-WIL steam pipe casings. A series of controlled model experiments at the contractor's plant demonstrated that one or more leaks in a buried steel pipe could be detected by surface measurement of tracer gas concentrations. A full-scale demonstration test was conducted at Naval Air Station-North Island on a 400-foot casing with suspected leaks. Two leaks were localized to within three feet using the hardware and procedure developed during the controlled experiments. Simplification would be required before this tracer gas technique could be used on a routine service basis at Air Force bases. (Author)

ANL-79-4 PC **A05**/MF **A01**
Argonne National Lab., IL.
Nondestructive Evaluation Techniques for Silicon Carbide Heat-Exchanger Tubes. Annual Report, October 1977--September 1978.
D. S. Kupperman, D. Yuhas, C. Sciammarella, N. P. Lapinski, and N. Fiore. Mar 79, 80p
Contract W-31-109-ENG-38

Descriptors: *Heat exchangers, *Silicon carbides, *Tubes, Acoustic testing, Ceramics, Corrosion resistance, Defects, Holography, Industrial radiography, Inspection, Internal friction, Materials, Materi-

als testing, *Nondestructive testing, Ultrasonic testing.
Identifiers: ERDA/420200, ERDA/420500, ERDA/360201.

For abstract, see ERA citation 04:045202.

METC/RI-79/5(Rev.2) PC **A03**/MF **A01**
Department of Energy, Morgantown, WV. Morgantown Energy Technology Center.
Prototype Lockhopper Valve Test Plan.
J. F. Gardner, and F. D. Freeburn. Mar 79, 39p

Descriptors: *Hoppers, *Valves, Coal gasification plants, Performance testing, Planning.
Identifiers: ERDA/010404, Design criteria.

For abstract, see ERA citation 04:040091.

N79-28566/4GA PC **A22**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Off-Design Performance of Pumps, Volume 1.
1978, 515p VKI-LEC-SER-1978-3-V-1
Seri-2. Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 6-8 Mar. 1978.

Descriptors: *Axial flow pumps, *Centrifugal pumps, *Design analysis, *Performance prediction, Cavitation flow, Computerized simulation, Flow distribution, Mathematical models, Turbomachine blades, Vortices.
Identifiers: *Meetings.

For abstract, see STAR 1719

PATENT-4 134 571
Not available NTIS
Department of Energy, Washington, DC.
Double-Disc Gate Valve.
Patent,
S. J. Wheatley. Filed 3 Nov 77, patented 16 Jan 79, 6p PAT-APPL-847 999
Supersedes PAT-APPL-847 999-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: Gaseous diffusion plants, *Valves, Design.
Identifiers: ERDA/050501, ERDA/420200, *Patents, *Gate valves, Antijamming.

For abstract, see ERA citation 04:042373.

PB-298 883/0GA Not available NTIS
National Bureau of Standards, Washington, DC.
Fracture Mechanics Analysis of Pipeline Girthwelds.
Final rept.,
H. I. McHenry, D. T. Read, and J. A. Begley. 1979, 11p
Sponsored in part by Department of Transportation, Washington, DC. Materials Transportation Bureau.
Pub. in American Society for Testing and Materials, Special Technical Publication 668, p632-642 1979.

Descriptors: *Pipelines, *Welded joints, Pipe joints, Weld defects, Fracture(Materials), Toughness, Manganese steels.
Identifiers: Reprints, Fracture(Mechanics).

Size limits for surface flaws in pipeline girthwelds are calculated on the basis of fracture mechanics analysis. Parameters for the analysis were selected from data on a 1.22-m-diameter (48 in.), 12-mm-thick (0.46 in.) pipe welded by the shielded metal-arc process. The minimum fracture toughness of the welds as determined by the crack opening displacement (COD) method was 0.1 and 0.18 mm (0.004 and 0.007 in.), depending on the flaw location. The yield strength of the welds was 413 MPa (60 ksi). Because the toughness to yield strength ratio was high, elastic-plastic fracture mechanics analysis methods were required to determine critical flaw sizes.

13L. Safety Engineering

AD-A070 567/3GA PC **A05**/MF **A01**
Giannotti and Buck Associates Inc Riverdale MD
Critical Evaluation of Low-Energy Ship Collision Damage Theories and Design Methodologies. Volume I. Evaluation and Recommendations.
Final rept. 28 Feb 77-28 Jul 78,
P. R. Van Mater, Jr., J. Giannotti, N. Jones, and P. Genalis. Jul 78, 92p SSC-284
Contract DOT-CG-63738-A
See also Volume 2, AD-A070 568.

Descriptors: *Ships, *Collisions, Structural analysis, Ship structural components, Low energy, *Damage assessment, Methodology, Records, Statistical analysis, Energy absorbers, State of the art, Mathematical models.
Identifiers: *Ship collisions, Ship accidents.

This is Volume I of a two-volume report describing the results of a Ship Structure Committee study aimed at conducting a critical evaluation of low-energy ship collision damage theories and design methodologies. Data sources on ship collision damage are identified including model experiments and full scale information obtained from ship casualty records. The assumptions made by existing theories for analyzing low energy collisions are assessed and the collision energy absorption mechanisms are ranked. A method is proposed for extending Minorsky's original high-energy analysis to the low-energy regime. Recommendations for use of existing methods and for further research are made. (Author)

AD-A070 568/1GA PC **A03**/MF **A01**
Giannotti and Buck Associates Inc Riverdale MD
Critical Evaluation of Low-Energy Collision Damage Theories and Design Methodologies. Volume II. Literature Search and Review.
Final rept. 28 Feb 77-28 Jul 78,
P. R. Van Mater, Jr., J. Giannotti, and P. Genalis. Jul 78, 44p
Contract DOT-CG-63738-A
See also Volume 1, AD-A070 567.

Descriptors: *Ships, *Collisions, Marine engineering, *Damage assessment, Ship structural components, Low energy, State of the art, Shipbuilding, Safety, Test and evaluation, Structural analysis.
Identifiers: *Ship collisions, Ship accidents.

This report is Volume II of a two-volume report prepared under Ship Structure Committee Project SR-237,'Critical Evaluation of Low Energy Collision Damage Theories and Design Methodologies'. The material contained herein is the result of one of the tasks of the project which called for conducting a literature search and review of documents relevant to low-energy collision damage. The various data resources used were identified; the state of the art in ship collision research was summarized; an annotated bibliography of the key documents was prepared and a list of references which are considered to be relevant to the problem was developed. Volume I contains the actual assessment of the various low-energy collision damage theories and design methodologies along with recommendations for their use and future research. (Author)

AD-A071 058/2GA PC **A17**/MF **A01**
ORI Inc Silver Spring MD
Study of Task Performance Problems in Reports of Collisions, Rammings, and Groundings in Harbors and Entrances.
Final rept.,
B. Paramore, V. Keith, P. King, J. Porricelli, and R. Willis. Mar 79, 385p ORI-TR-1474, USCG-D-28-79
Contract DOT-CG-41903-A

Descriptors: *Accidents, *Harbors, Collisions, *Ships, Barges, Tugboats, Statistical analysis.
Identifiers: Grounding accidents, Ship accidents, Accident causes.

This is a study of vessel accidents in harbors and harbor entrance areas. It addresses accidents involving at least one ship of more than 10,000 gross registered tons or a tug or towboat-barge array. The study period is fy 1972-76. The first objective was to identify patterns in accident causal factors, especially the coincidence of characteristics of the maneuvering situation and problems in task performance by the vessel controller. An additional objective was to evaluate the potential of proposed solutions to vessel control problems. The study involved controlled data-taking from the archive of accident reports maintained by the U.S. Coast Guard. A multivariate analysis design was employed to allow combinations of factors to be explored, since vessel accidents rarely can be attributed to a single cause.

LA-7597-MS PC **A04**/MF **A01**
Los Alamos Scientific Lab., NM.
Design of Safe Electrical Equipment for Research.
J. L. Rand, R. W. Leep, and W. A. Bradley. Apr 79, 59p
Contract W-7405-ENG-36

Descriptors: *Capacitors, *Electric generators, *Electrical equipment, *Laboratory equipment, Breakdown, Design, Dielectric materials, Dielectric properties, Electric cables, Experimental data, Graphs, Hazards, Safety, Safety engineering, Stress analysis, Stresses, Tables.
Identifiers: ERDA/420600.

For abstract, see ERA citation 04:043625.

NBS-GCR-78-149 PC **A02**/MF **A01**
Department of Energy, Washington, DC. Div. of Fossil Fuel Utilization.
Analysis of Fire Reports on File in the Massachusetts State Fire Marshal's Office Relating to Wood and Coal Heating Equipment.
J. W. Shelton. Nov 78, 11p
Contract EA-77-A-01-6010

Descriptors: *Wood burning furnaces, Data compilation, *Fires, Installation, Maintenance, Operation, Residential sector, Safety.
Identifiers: ERDA/090400, ERDA/320101, ERDA/299003, Fire hazards, Fire safety.

For abstract, see ERA citation 04:040499.

PB-298 562/0GA PC **A07**/MF **A01**
North Carolina Univ. at Chapel Hill. Highway Safety Research Center.
Techniques for Predicting High-Risk Drivers for Alcohol Countermeasures. Volume II: User Manual.
Final rept. Jun 75-Jun 78,
Forrest M. Council, John H. Lacey, and J. Richard Stewart. Jun 78, 150p DOT-HS-804 733
Contract DOT-HS-5-01250

Descriptors: Predictions, Mathematical models, Statistical analysis, Motor vehicle operators, Evaluation, Benefit cost analysis, Traffic safety, Highway transportation, Rehabilitation, PL/1 programming language, Manuals, Computer programs.
Identifiers: *Alcohol related crashes, *High risk drivers, Alcohol safety action projects, Drinking drivers, ECP computer program.

This User Manual, a companion to the Volume I Technical Report by the same name, is designed to aid the alcohol program administrator in his decisions concerning implementation of countermeasures to selected individuals or small groups of drivers. Volume I describes the development of statistical models to predict the probability of a future alcohol-related crash for six high-risk groups of drivers. Volume II, the User Manual, presents the ways in which alcohol administrators can use the developed predictor models. The User Manual contains information concerning the inputs of the predictive models, information concerning the cost and effectiveness of potential countermeasure programs, and procedures for conducting an economic analysis methodology to help the administrator decide whether or not a chosen countermeasure pays off in terms of reducing the predicted number of alcohol-related crashes. In addition, the final chapter of the manual presents a brief overview of evaluation techniques and problems as they relate to trial alcohol programs. This Volume also contains computational forms for use in the economic analysis, a computer program that carries out the analysis methodology, and information concerning the background material on alcohol and driving and the statistical development of predictor models.

PB-298 657/8GA Not available NTIS
National Bureau of Standards, Washington, DC.
Fire Alarm Communications.
Final rept.,

R. W. Bukowski, R. L. P. Custer, and R. G. Bright. 1979, 27p
Pub. in Handbook of Building Security Planning and Design, Chapter 19, p19-1-19-27 1979.

Descriptors: *Fire alarm systems, *Telecommunication, Fire detection systems, Control equipment, Residential buildings, Multiplexing, Standards.
Identifiers: Reprints.

The operation and use of all current types of fire alarm and communication systems is discussed. This includes the differences between and operating features of local, auxiliary, remote station, proprietary, and central station systems, high-rise communication systems and residential fire detection devices. A discussion of commonly used fire detectors is given including operation, installation and application considerations. Indicating devices, sprinkler supervisory devices, maintenance, reliability and code/standard compliance is also covered.

PB-298 759/2GA PC **A03**/MF **A01**
National Fire Protection Association, Boston, MA.
An Analysis of the NFPA 1977 National Fire Experience Survey.
Final rept.,
Michael J. Karter, Jr. Apr 79, 43p
Contract FO-A01-78-1038

Descriptors: *Fire losses, Statistical analysis, Fires, Populations, Communities, Fire departments, Residential buildings, Commercial buildings, Municipalities, Mortality, Injuries.

Based on the National Fire Protection Association (NFPA) 1977 National Fire Experience Survey, an analysis of four fire experience measures -- number of fires per thousand people, number of civilian deaths per million people, number of civilian injuries per million, and dollar loss per capita -- was undertaken. In addition, the relationship of these measures to community size and fixed property use also were analyzed. The analysis resulted in several findings: (1) County fire departments experience similar fire rates to non-county departments; (2) The largest and smallest communities have the highest fire rates; (3) Residential fire rates are higher than non-residential rates in terms of deaths, injuries, and dollar loss.

PB-298 905/1GA PC **A04**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Railroad Accident Report Bay Area Rapid Transit District Fire on Train No. 117 and Evacuation of Passengers while in the Transbay Tube, San Francisco, California, January 17, 1979.
19 Jul 79, 63p NTSB-RAR-79-5

Descriptors: *Rapid transit railways, *Accident investigations, Fires, Tunnel, San Francisco Bay, Evacuating(Transportation), Smoke, Death, Injuries, Damage, Fire fighting, Rescue operations, Inspection, Switchgear.
Identifiers: Bay Area Rapid Transit, San Francisco(California), Oakland(California).

About 6:06 p.m., on January 17, 1979, the fifth and sixth cars of the seven-car westbound train No. 117 of the Bay Area Rapid Transit District (BART) caught fire while moving through the tunnel under the San Francisco Bay between Oakland and San Francisco, California. Forty passengers and two BART employees were evacuated from the burning train through emergency doors into a gallery walkway located between the two single track tunnels and then into a waiting train in the adjacent tunnel. One fireman died when the gallery suddenly filled with heavy black toxic smoke. Twenty-four firemen, seventeen passengers, three emergency personnel, and twelve BART employees were treated for smoke inhalation. Property damage was estimated to be $2,450,000. The National Transportation Safety Board determines that the probable cause of this accident was the breaking of collector shoe assemblies on Train No. 117, when it struck a line switchbox cover, which had fallen from an earlier train, resulting in a short circuit and fire. Contributing to the severity of the damage was the failure of BART to quickly and properly coordinate the Oakland and San Francisco fire departments' rescue and firefighting efforts, which did not conform with the emergency plan. The cause of the fatality and injuries was inhalation of smoke and toxic fumes emitted from burning plastic materials used in construction of the transit cars.

PB-299 043/0GA PC **A05**/MF **A01**
Louisiana Dept. of Public Safety, Baton Rouge. Office of State Fire Protection.
Baton Rouge Fire Household Survey.
Final rept.
Feb 79, 89p
Grant FA-7X009
Prepared by Sunbelt Research Corp., Baton Rouge, LA.

Descriptors: *Fire losses, *Residential buildings, Surveys, Damage, Demographic surveys, Profiles, Urban areas, Louisiana.
Identifiers: Baton Rouge(Louisiana).

The report presents results of a household survey conducted in Baton Rouge, Louisiana, to (1) analyze residential fire rates and levels of residential fire risk within the social and economic context of the community, and (2) determine direct and indirect losses associated with residential fires. Two hundred fifty households which experienced a residential fire in Baton Rouge between July 1977 and June 1978 were interviewed. A total of $1,515,599 in monetary losses, direct and indirect, and damages were reported by the households surveyed. In addition, 30.4 percent of the respondents indicated that items of 'personal value' were destroyed, and 28 percent identified an emotional reaction by a member or members of their families following the fire. The report contains historical residential fire incidence data for 1970 through 1976; a demographic profile of the study area -- the City of Baton Rouge; an explanation of the methodology used for the study; an analysis of survey results; and an analysis of direct and indirect fire loss data obtained in the survey.

PB-299 186/7GA PC **A03**/MF **A01**
National Transportation Safety Board, Washington, DC. Bureau of Accident Investigation.
Marine Accident Report: Collision of M/V STAR LIGHT (Greek) and the USS FRANCIS MARION, Norfolk, Virginia - March 4, 1979.
2 Aug 79, 27p NTSB-MAR-79-12

Descriptors: *Cargo ships, *Amphibious assault ships, *Accident investigations, Collisions, Chesapeake Bay, Radar navigation, Naval vessels.
Identifiers: *Ship accidents, Star Light vessel(Greece), Francis Marion vessel, Norfolk(Virginia), Speed, Human factors.

About 0842, e.s.t., on March 4, 1979, the outbound Greek cargo ship M/V STAR LIGHT and the inbound U.S. Navy amphibious assault ship USS FRANCIS MARION (LPA-249) collided at the entrance of the Chesapeake Bay about 15 nmi east of Norfolk, Virginia. The bow of the STAR LIGHT struck amidship on the starboard side of the FRANCIS MARION. There were no deaths; however, three naval personnel were injured in the accident. Damage to the vessels was estimated at about $3.5 million. The National Transportation Safety Board determines that the probable cause of this accident was the failure of the master of the STAR LIGHT to comply with the starboard-to-starboard passing agreement that was made with the FRANCIS MARION. Contributing to the accident were the failure of the STAR LIGHT's navigation watch to plot the radar data, and the relatively high closing speeds of both vessels.

13M. Structural Engineering

AD-A070 644/0GA PC **A12**/MF **A01**
PMB Systems Engineering Inc San Francisco CA
Failure Criteria for Reinforced Concrete Structures. Volume II. Analytical Model and Response Data.
Final rept.,
Richard W. Litton, and Jawahar M. Gidwani. May 79, 267p AFWL-TR-77-239-VOL-2
Contract F29601-76-C-0135
See also Volume 1, AD-A070 643.

Descriptors: *Reinforced concrete, Structural engineering, *Blast loads, Failure(Mechanics), Mathematical models, Finite element analysis, Three dimensional, Nonlinear systems, Deformation, Rectangular bodies, Cylindrical bodies, Sampling.

Failure criteria defining complete loss of section strength for reinforced concrete sections are defined in this Volume II of the report. Failure envelopes obtained from a three-dimensional finite element analysis with a three dimensional nonlinear constitutive material model are presented in terms of deformations for various rectangular and cylindrical sections. Applications and examples of the use of these failure envelopes are also presented. (Author)

AD-A070 917/0GA PC **A05**/MF **A01**
Army Natick Research and Development Command MA
Experimental Measurement of Strain and Deflection in a Uniformly Loaded Simply Supported Composite Panel.
Final rept. Jan 76-Sep 77,
Franklin D. Barca. Nov 78, 81p Rept no. NATICK/TR-79/018

Descriptors: *Sandwich panels, *Honeycomb cores, *Stress analysis, *Walls, Shelters, Composite structures, Deflection, Aluminum, Skin(Structural), Paper, Strain(Mechanics), Deflection, Instrumentation.

The details of a study to experimentally determine the strain and deflection profile induced in a uniformly loaded, simply supported 1.1-m x 2.3-m aluminum-skin Kraft-paper-honeycomb-core sandwich panel are documented. Twelve panels typical of the type used in military rigid wall tactical shelters were tested at loadings up to 70 kPa. The experimental procedure and apparatus, including a special vacuum chamber constructed to stress the large panels, are described as well as details of the various panels tested. the effects of loading arrangement, strain gage transverse sensitivity and adhesive joint location are addressed. Panel strain and deflection data and core shear data are presented. (Author)

AD-A071 066/5GA PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Roof Moisture Survey - U. S. Military Academy.
Special rept.,
Charles Korhonen, and Wayne Tobiasson. May 79, 11p Rept no. CRREL-79-16

Descriptors: *Roofs, *Moisture, Surveys, Army, Infrared equipment, Cameras, New York.
Identifiers: West Point(New York), *Infrared detection.

The roofs and upper story walls of buildings 745E, 752, and 756 at the U.S. Military Academy, West Point, New York, were surveyed with a hand-held infrared camera to locate sources of reported wall leaks. An electrical resistance probe was used to determine the relative level of moisture in wall components. Several 3-in.-diam core samples of each roof were obtained to verify suspected moisture conditions and to examine the roof membrane in cross section. Wet areas on each roof were outlined with white spray paint. Wall leaks are believed to be caused by wind-driven rain entering the parapet walls in locations where the decorative glaze-coat has spalled off. Recommendations for maintenance of these buildings are based on information derived from the infrared survey, electric resistance readings, core samples and visual examinations. (Author)

NUREG/CR-0689 PC **A23**/MF **A01**
University of Southern California, Los Angeles. Dept. of Civil Engineering.
Methods for Prediction of Strong Earthquake Ground Motion.
Feb 79, 532p

Descriptors: *Buildings, Computer codes, *Earthquakes, Data processing, E codes, Forecasting, Fortran, Ground motion, Mechanical vibrations, *Risk assessment, S codes, Seismic effects, Site selection, Standards, Wave propagation.
Identifiers: ERDA/580201, ERDA/220501, Earthquake engineering, *Seismic risk.

For abstract, see ERA citation 04:045474.

PB-298 559/6GA PC **A03**/MF **A01**
National Engineering Lab. (NBS), Boulder, CO. Electromagnetic Fields Div.

Feasibility Study on the Use of a Microwave System for the Nondestructive Evaluation of Historic Adobe Structures.
D. R. Belsher. Jul 79, 33p NBSIR-79-1610
Contract NPS-PX-8109-9-0003

Descriptors: *Brick structures, *Nondestructive tests, Electromagnetic testing, Microwaves, Continuous wave radar, Dielectric properties, Moisture, Feasibility, Measurement.
Identifiers: Adobe bricks, Adobe soils.

A frequency-modulated continuous wave (FM-CW) radar system was used at Tumacacori National Monument to provide usable on site information and to evaluate its potential for nondestructively measuring certain parameters associated with the soundness of historic adobe walls. The parameters of interest considered were layer thickness, presence, position, and thickness of voids or other inhomogeneities, and moisture content and its distribution. The results were generally favorable. The results indicate that an FM-CW system can nondestructively provide a major portion of the information needed to evaluate the soundness of adobe structures at a relatively low cost and in less time than present techniques. With some further work the FM-CW system can be developed into a useful archeological exploration and evaluation tool that should operate in rock and soils other than adobe.

PB-298 627/1GA PC **A16**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Building Economics and Regulatory Technology Div.
Research and Innovation in the Building Regulatory Process.
Final rept.,
Patrick W. Cooke. Jul 79, 361p NBS-SP-552
Sponsored in part by National Conference of States on Building Codes and Standards, Inc., McLean, VA. See also 2nd Annual Conference, dated Aug 78, PB-284 518. Library of Congress catalog card no. 79-600090. Proceedings of NBS/NCSBCS Joint Conference (3rd), Annapolis, MD., 12 Sep 78,

Descriptors: *Buildings, *Building codes, *Regulations, *Meetings, Energy conservation, Solar heating, Structural engineering, Design criteria, Fire safety, Cost analysis, Law(Jurisprudence), Design standards.
Identifiers: *Metrication, Computer applications.

The third NBS/NCSBCS Joint Conference on Research and Innovation in the Building Regulatory Process was held in Annapolis, Maryland on September 12, 1978. The proceedings of the Joint Conference include the opening remarks, the Keynote Address and the 24 papers presented at the technical sessions dealing with various aspects of building regulatory research and innovative administrative application of building codes and standards. The eight technical sessions were organized around the following themes: Regulatory Aspects of Fire Safety; Standards Development Activities and the Building Regulatory Process; Accommodating Provisions for the Elderly and Handicapped in Building Regulations; Implementation of Energy Conservation Building Regulations at the State Level; Application of Computers and Information Systems for Building Regulation and Construction; Energy Conservation, Solar Energy and the Built Environment; Issues Concerning the Intent, Formulation and Economic Impact of Regulations; and Metrication, Industrialized Buildings and Complex Structures. In addition, three other research papers covering Lighting, Tax Shelters, Resource Zoning, and Land Use Planning are also included.

PB-298 744/4GA PC **A03**/MF **A01**
Sydney Univ. (Australia). Civil Engineering Labs.
The Effects of Freestream Turbulence on the Galloping Behaviour of a Square Tower.
Research rept.,
K. C. S. Kwok, and W. H. Melbourne. Dec 78, 43p R-338

Descriptors: *Towers, *Aerodynamic forces, Wind pressure, Aerodynamic loads, Turbulent boundary layer, Spectral energy distribution, Wind tunnel tests.
Identifiers: *Foreign technology.

Galloping is the term used to describe large amplitude single degree of freedom motions of a structure associated with a sectional aerodynamic force characteristic which produces a force in the direction of and in phase with the cross-wind motion. Detailed experimental investigations show that freestream turbulence has profound effects on the galloping behavior of a square tower. It is generally believed that increase in freestream turbulence increases the turbulence mixing in the separated shear layers and the rate of entrainment from the wake, and decreases the radius of curvature of the shear layers. These effects significantly alter the transverse force characteristic and hence the galloping behavior of the tower. It is also shown that the fine scale turbulence produced by a thin rod upstream of the stagnation streamline of the tower is sufficient to cause these effects.

PB-298 784/0GA PC **A03**/MF **A01**
National Engineering Lab. (NBS), Washington, DC. Center for Building Technology.
The Use of Aerial Infrared Thermography to Compare the Thermal Resistances of Roofs.
Final rept.,
D. M. Burch. Aug 79, 43p NBS-TN-1107
Sponsored in part by Department of Energy, Washington, DC.

Descriptors: *Roofs, *Thermal resistance, Thermography, Infrared detection, Aerial surveys, Heat loss, Thermal radiation.
Identifiers: Energy audits, Energy conservation.

The paper investigates whether a comparative roof survey using aerial infrared thermography can be used to rank the roofs of residential and commercial buildings according to their thermal resistance. Mathematical models are presented for predicting the apparent radiance temperatures of these roof systems. These models are used to investigate the differences in apparent radiance temperature between roofs having various thermal resistances. These predicted differences are then compared with predicted differences in apparent radiance temperature caused by typical variations in roof emittance, local outdoor temperature, and local wind speed throughout the macroclimate. The transmission characteristics of the atmosphere are reviewed, and the required dew-point spread for preventing dew or frost formation on a roof is examined.

PB-298 827/7GA PC **A03**/MF **A01**
Transport and Road Research Lab., Crowthorne (England).
Site Investigation Aspects of the River Tyne Siphon Sewer Tunnel.
M. J. Dumbleton, and S. D. Priest. 1978, 37p
TRRL-LR-831

Descriptors: *Tunnels, *Sewers, *Underwater structures, Site surveys, Geophysical surveys, Geology, Boreholes, Design, Specifications, Construction, Compressed air, Geological faults, Great Britain.
Identifiers: *Foreign technology.

This report is one of a series of case studies of tunnel projects made from the point of view of the site investigation. The tunnel was constructed under the River Tyne through Coal Measures mudstone with seams of sandstone, shale and coal. Information was already available from geological studies and experience in nearby tunnels. Faults, rock fracture caused by mining subsidence, and ancient scouring of the river bed gave the possibility of connection with the overlying water-bearing sands and gravels, and the tunnel depth initially chosen was therefore increased. The site investigation established the levels and character of the deposits present, the distribution of faults and data for shaft and tunnel design. Boreholes were supplemented bby over-water seismic surveys. A tunnelling shield and compressed air were specified, because of the possible danger of connection with the river above. Machine excavation was satisfactory in the mudstone, but drilling and blasting was required for a full face of sandstone. Probing ahead from the face detected water-bearing and clay-filled fissures which were successfully negotiated using compressed air. The general implications of the site investigation experience are reviewed. (Copyright (c) Crown Copyright 1978.)

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-A070 629/1GA PC **A04**/MF **A01**
Dynamic Sciences International Inc Sepulveda CA
Test Program Set Cost Algorithm.
Final rept. 21 Sep 77-Apr 78,
D. James Zingg, Al V. Robertson, and Dave McIntyre. May 79, 69p CORADCOM-77-2727-F-1
Contract DAAB07-77-C-2727

Descriptors: *Test equipment, *Life cycle costs, Automatic, Test sets, Algorithms, Cost analysis, Learning curves, Test methods, Management engineering, Computer programs.
Identifiers: Automatic test equipment.

The Test Program Set Cost Algorithm provides a methodology for identifying and quantifying the funding costs of major tasks in Test Program Sets (TPS's) development. Areas that are addressed by the study include the learning curve effect, impact of ATE maturity, impact of UUT (Unit Under Test) Testability, effect of design guides on development and life-cycle costs, management-controlled cost factors, utilization of Automatic Test Program Generation (ATPG), development costs vs. life-cycle costs, fault insertion and customer 'sell-off', and commercial vs. military support. The basic algorithm deals with the analysis, coding, checkout and sell-off of a test program set but other factors such as overhead support, interface device design, ATE compatibility, etc., are discussed. The application and usage of the algorithm should provide a valuable estimating tool to assess costs associated with Test Program Set development. (Author)

AD-A070 721/6GA PC **A11**/MF **A01**
Brown (Neil) Instrument Systems Inc Cataumet MA
Three Axis Acoustic Current Meter.
10 May 79, 242p
Contract N00014-75-C-0113

Descriptors: *Flowmeters, Acoustic equipment, Analog to digital converters, Phase measurement, phase shift, Frequency response, Mooring, Turbulent flow, Multiplexing, Fluid flow, Digital systems, Signal to noise ratio, Buoys, Velocimeters, Accelerometers.

During the first phase of this contract, design concepts and prototype hardware were generated, leading to a successful demonstration of the capabilities of an acoustic phase shift velocity sensor. Success of the initial feasibility-study phase of this development program led to an extension of the scope of contract to include design and fabrication of sea-worthy moored current meters. Work to this end began in 1976 and led to production of three units configured to specific requirements of the NOAA National Data Buoy Office. these units were tested extensively by the Test and Evaluation Laboratory of NOAA. The three prototype current meters fabricated pursuant to contract have been repeatedly and successfully deployed by National Data Buoy Office. These deployments have proved the accuracy and reliability of the design and its suitability for use under arduous conditions. The successful outcome of the second phase of contract development encouraged Neil Brown Instrument Systems, Inc. to continue work on moored current meter design and has resulted in the instrument described within the body of this report. At least twenty of these units have undegone testing and deployment, with results which though preliminary, are extremely encouraging.

AD-A070 769/5GA PC **A06**/MF **A01**
Dynamic Sciences International Inc Sepulveda CA
Test Program Set (TPS) Design Guide for Planning and Specification of TPS's and Engineering Preparation and Assessment of TPS's.
Final rept. Sep 77-Jul 78,
D. James Zingg, and Al V. Robertson. May 79, 123p CORADCOM-77-2727-F-2
Contract DAAB07-77-C-2727

Descriptors: *Test equipment, *Test methods, Electronic equipment, Management engineering,

Logistics support, Configuration management, Management planning and control, Army procurement, Cost effectiveness, Systems management, Test sets, Automatic, Repair, Computer programs, Standardization.
Identifiers: Automatic test equipment.

The Test Program Set (TPS) Design Guide provides guidelines and requirements in two major problem areas. It is a planning and specification guide for the competitive procurement of application test program sets for Units Under Test (UTT's) and it also is an engineering guide that provides design and evaluation criteria to ensure acquisition of complete and uniform TPS's. Topics covered in the design guide include support concepts, data collection, levels of repair, automatic test design considerations, test program set design, interface device design, code and compile, integration, design reviews, and acceptance testing. Discussed are Automatic Test Equipment (ATE) hardware and software design considerations such as ATE standardization, ATE expandability, and ATE availability which impact total operational life cycle costs. Also covered are required configuration management techniques of identification, control and accounting of test programs. (Author)

AD-A070 840/4GA PC **A18**/MF **A01**
Army Research Office Research Triangle Park NC
Proceedings of the Conference on the Design of Experiments in Army Research, Development, and Testing (24th) Held at Mathematics Research Center, University of Wisconsin, Madison, Wisconsin on 4 - 6 October 1978.
Interim technical rept.
Jun 79, 407p Rept no. ARO-79-2

Descriptors: *Experimental design, Statistical processes, Experimental data, Data processing, *Army research, Weather modification, Environmental management, Sampling, Geodetic surveys, Analysis of variance, Random number generators, Estimates, Curve fitting, Acceptability, Monte Carlo method, Statistical tests, War games, Reliability, Failure, Forecasting, Trade off analyses.

This report contains most of the papers presented at the 24th Conference on the Design of Experiments in Army Research, Development and Testing. These treat various Army statistical and design problems. Topics included: weather experiments, sequential designs, environmental quality problems, red noise, small sample behavior, rapid geodetic survey system, analysis of variance, partial factorial experiments, experiments in sorptivity, pseudo-random number generators, point and interval estimation, regression on Bernoulli random variables, smoothing curves and surfaces, acceptance criteria, quantal response curves, Monte Carlo simulation of a probability ratio sequential test, statistical consulting, laser beam war games, structural reliability, mechanical behavior of materials, Stewartson's liquid instability/stability criteria, graphical technique for analyzing failure and surveival data, and efficiency of estimators of reliability.

AD-A070 844/6GA PC **A03**/MF **A01**
Grumman Aerospace Corp Bethpage NY Research Dept
Development of Calorimetric Fatigue Gauge.
Final rept.,
John M. Papazian, Richard Delasi, and Philip N. Adler. May 79, 43p Rept no. RE-572
Contract N00019-76-C-0651

Descriptors: *Fatigue(Mechanics), Measuring instruments, Thermal analysis, *Calorimeters, Test methods, Stress analysis, Test and evaluation, Exposure(General), Aircraft maintenance, Life expectancy, Failure(Mechanics).
Identifiers: Aluminum alloy 7050.

A research effort to devise a new fatigue gauge for aircraft is described in this report. Differential scanning calorimetry was used to detect microstructural changes resulting from strain-controlled fatigue exposure of aluminum alloy 7050. The calorimetric signature of the microstructure was determined for samples that had been cycled to failure at strains of +0.3, +0.6, and +1.5%. Some samples were also fatigued to failure with a small positive or negative mean strain offset, and others were cycled to 30% or 70% of their expected life at +1.5%. Thermodynamic and kinetic analyses of the calorimetric results revealed a pronounced effect of fatigue at +1.5% strain on the reaction enthalpy and reaction kinetics of the GP zone dissolution peak. The reaction enthalpy decreased systematically as the number of cycles increased. No effects of fatigue on the calorimetric results were observed in the samples that were fatigued at +0.3 and +0.6%. Based upon these results the characteristics of a potential 'calorimetric fatigue gauge' were outlined. Such a gauge would only be sensitive to low cycle 'plastic' fatigue and would produce a cumulative damage parameter, thus indicating the percentage of lifetime expended.

AD-A070 912/1GA PC **A02**/MF **A01**
Trinity Univ San Antonio TX Dept of Engineering Science
A Theoretical Investigation of Power and Control Configurations for a High G-Onset Centrifuge Drive System.
Final technical rept. Jun 78-May 79,
T. J. Jones. 22 May 79, 11p AFOSR-TR-79-0820
Grant AFOSR-78-3622

Descriptors: *Centrifuges, Control systems, Drives(Electronics), Electric power, Acceleration, Aerial warfare, Humans.
Identifiers: G forces, *Aircraft maneuver's.

An investigation of both the power drive system and the control system for high G-onset rates in a human centrifuge was carried out. Although the analysis was general, much of it specifically considered the A/F 37V-1 centrifuge at Brooks AFB. It is shown that an electric drive system, and gondola passenger control of G forces results in a system capable of simulating aerial combat maneuvers. The drive system consists of an SCR control of the A.C. line voltage applied to D.C. motors. The control system provides for cockpi. stick control of the centrifuge's angular velocity and angular acceleration. (Author)

AD-A070 931/1GA PC **A05**/MF **A01**
Systran Corp Dayton OH
MATE Support Software Analysis.
Final technical rept. Feb-Aug 78,
W. Lynn Trainor. Aug 78, 92p AFAL-TR-78-166
Contract F33615-77-D-1042

Descriptors: Computer programs, *Test equipment, Computer architecture, Digital computers, Modular construction, Digital systems, Automation, Life cycle costs, Weapon systems, Procurement, Avionics.
Identifiers: Airborne computers, Computer programming, Information systems, MATE project.

This report describes a research study, the objective of which was to analyze and document those elements of support software used on the Digital Avionics Information System (DAIS) Program which could satisfy the support software requirements of the Modular Automatic Test Equipment (MATE) Project. Since many of the objectives of the MATE Program are closely aligned with those of DAIS, it was felt that some of the software items and standards developed for DAIS could be applicable to the MATE Program. The first sections of this report present an overview of the three areas of ATE software: ATE software of current-day systems, additional ATE software requirements beyond those satisfied with current-day ATE software, and MATE-unique software requirements. Using these as a basis for comparison the DAIS software was analyzed for applicability to the MATE system. The results of this analysis are presented in the final sections. (Author)

AD-A070 995/6GA PC **A05**/MF **A01**
Toronto Univ Downsview (Ontario) Inst for Aerospace Studies
A New Type Flap Valve for Generating Sonic Booms in a Pyramidal Horn.
Interim rept.,
J. J. Gottlieb, W. Czerwinski, N. N. Wahba, and R. E. Gnoyke. Oct 78, 82p UTIAS-208, AFOSR-TR-79-0768
Grant AFOSR-77-3303

Descriptors: *Valves, *Simulators, *Sonic boom, *Jet engine noise, Test facilities, Traveling waves, Acoustics, Mathematical models.
Identifiers: Flap valves, Pyramidal horns.

A description is given of the design, operation and performance of a radically new type of sonic-boom generating flap-valve. Included are the ancillary cam, clutch, flywheel and electric motor system, as well as a much larger air reservoir than used previously. An updated and greatly extended analysis describes the time varying reservoir conditions (e.g., pressure) and mass-flow rate of air through the flap valve, as well as the wave motion or characteristics of the travelling N-wave in the pyramidal concrete horn (25 m long with a 3 m x 3 m base) of the UTIAS travelling-wave sonic-boom simulation facility. (Author)

AD-A071 029/3GA PC **A08**/MF **A01**
O'Donnell and Associates Inc Pittsburgh PA
Hypervelocity Wind Tunnel Components Structural Evaluation. Volume 1.
Final rept.,
D. Peterson, and E. Westermann. May 79, 153p
Rept no. ODAI-1270-8-79-VOL-1
Contract N60921-78-C-0013

Descriptors: *Pressure vessels, *Stress analysis, *Hypersonic wind tunnels, Screw threads, Parts, Fatigue life, Fatigue(Mechanics), High pressure, Crack propagation, Finite element analysis, Computer graphics, Life expectancy, Confidence level, Inspection.

A structural evaluation of the large threaded pressure vessels in the wind tunnel facility was performed using finite element techniques coupled with fatigue and fracture mechanics analyses of the critical locations. The results of this evaluation show that these threaded pressure vessels have limited fatigue life due to high stress concentrations at the root of the thread root radii in the threaded end closures. Design modifications were made to the most critical end closures (Bottom End of Mach 14/18 Heater Vessel and Inlet End of Driver Vessel) to increase the design life of these pressure vessels. The design life of all of the threaded pressure vessels was also increased by reducing the maximum pressure at which they are operated. Periodic inspection requirements which account for variable pressure cycling and mean stress effects were also developed for the critical areas of these threaded pressure vessels. The net result of the design modifications, reduced operating pressures and periodic inspection requirements is to increase the design life and confidence in the safety related structural integrity of the threaded pressure vessels in the wind tunnel facility. (Author)

AD-A071 047/5GA PC **A23**/MF **A01**
Rockwell International Thousand Oaks CA Science Center
Proceedings of the ARPA/AFML Review of Progress in Quantitative Nondestructive Evaluation held 17-21 July 1978, La Jolla, California.
Rept. no. 4 (Annual) 1 Jul 77-30 Jun 78,
Donald O. Thompson. Jan 79, 545p
SC595.51AR, AFML-TR-78-205
Contract F33615-74-C-5180

Descriptors: *Nondestructive testing, *Ultrasonic tests, *Acoustic emissions, Adhesives, Composite materials, Ceramic materials, Defects(Materials), Detection.
Identifiers: *Meetings.

The edited transcripts of the ARPA/AFML Review of Quantitative Nondestructive Evaluation (NDE) held on July 17-21, 1978, at Scripps Institution of Oceanography, La Jolla, California, are presented in this document. Several key topics form the core of these presentations and discussions. They include quantitative ultrasonics, adhesives and composites, emissions related to failure prediction, residual stress, and reliability of ceramics. It is believed that this document provides a reasonable summary of NDE research and development currently underway. (Author)

AD-A071 102/8GA PC **A04**/MF **A01**
Battelle Columbus Labs OH
Multifrequency Eddy Current Inspection for Cracks Under Fasteners - Phase II.
Final technical rept. Apr 77-Nov 78,
G. H. Wilson, D. T. Hayford, and R. P. Meister.
Mar 79, 72p AFML-TR-79-4023
Contract F33615-76-C-5062
See also Rept. no. AFML-TR-76-209, AD-A040 591.

Descriptors: *Nondestructive testing, Eddy currents, Fastenings, *Cracks, *Wings, Splices, Steel, Titanium alloys, Airplane panels, Aircraft.

Identifiers: *Eddy current tests.

This report describes the second phase of a two-phase program. Phase I, reported in TR-76-209, was directed toward the evaluation and demonstration of multiple frequency eddy-current (MFEC) using wing-splice samples and laboratory instrumentation to detect cracks under titanium and steel fasteners. This Phase II report covers the development evaluation of a prototype MFEC system for field use. The system was built around commercially available micro-computer modules coupled with in-house designed eddy current electronics, an eddy current probe, and a multifunction operator control panel. The system was 'trained' using two C-5A wing panel sections having sawcuts to simulate cracks. Tenth-inch sawcuts at the top of the second layer could be repeatedly detected using a decision algorithm based on a combination of four frequencies. The prototype system was evaluated during July, 1978, as part of the C-5A Structural Evaluation and Inspection Program (SEIP). Of approximately 400 fasteners inspected with the system, one suspect was found and later confirmed with another NDE method. In continued development of the MFEC technique, methods must be investigated which will be tolerant of variations in geometry found around rib stiffeners and single fastener rows. (Author)

AD-A071 167/1GA PC **A03**/MF **A01**
National Aeronautical Establishment Ottawa (Ontario)
A Perturbation Theory of Two-Dimensional Transonic Wind Tunnel Wall Interference (Theorie De La Perturbation De L'Interference De Parois Dans Une Souffierie Bi-Dimensionelle Transsonique).
Aeronautical rept.,
Y. Y. Chan. Apr 79, 27p NAE-LR-598, NRC-17476
Summary in French.

Descriptors: *Transonic wind tunnels, *Boundary layer flow, *Interference, Walls, Perturbation theory, Two dimensional flow, Flow fields, Transonic airfoils, Angle of Attack.

The wind tunnel wall interference in transonic speed is formulated as perturbation to the basic flow around the airfoil in free air. The perturbation equation is derived from the transonic small disturbance equation and is linear but with variable coefficients containing the non-linear solution of the basic flow. The equation is solved numerically by a direct matrix method using the classical boundary condition for a porous wall. The solution in terms of lift versus angle of attack agrees well with that calculated directly from the small disturbance equation. (Author)

AD-A071 171/3GA PC **A04**/MF **A01**
Aeronautical Systems Div Wright-Patterson AFB OH
An Evaluation of Digital Liquid Crystal Display Quartz Movement Watches for Military/Government Use.
Final rept. Jun 78-Mar 79,
L. E. Ulman, Dave Gunning, Grant Boughton, Carmine Forzono, and Donald Stevens. May 79, 58p Rept no. ASD-TR-79-5008

Descriptors: *Clocks, Digital systems, Liquid crystal display systems, Military requirements, Test and evaluation, Questionnaires.
Identifiers: *Watches.

The PRAM Program Office conducted an evaluation to determine the feasibility of replacing mechanical analog watches with a commercially marketed quartz crystal digital display watch for those military and civilian personnel who normally use a government issues watch. It was believed that this type of watch would be less costly and inherently, more reliable, rugged and accurate than the currently used analog watches. An initial quantity of 500 digital display watches were procured for test and evaluation: 50 were used in laboratory hardware performance testing and the remaining 450 were distributed to personnel of the Air Force, Army, Navy and non-DoD government agencies. The majority of these were tested by USAF pilots, navigators and other aircrew personnel. At the end of the evaluation period, each subject completed a detailed questionnaire. These were then analyzed.

AD-A071 203/4GA PC **A03**/MF **A01**
Drexel Univ Philadelphia PA Dept of Mechanical Engineering and Mechanics
Microprocessor Utilization in Ultrasonic Nondestructive Inspection Systems.
Technical rept.,
Joseph L. Rose, and Graham H. Thomas. 15 Jun 79, 38p
Contract N00014-77-C-0607
Presented at the Fall ASNT Conference, Denver, CO., 1978.

Descriptors: *Nondestructive testing, *Radiography, Feasibility studies, *Ultrasonic tests, *Microprocessors, Laboratory tests, Digital systems, Scanning, Algorithms, Utilization, Interfaces, Ship hulls, Plates, Quality control, Inspection, Defects(Materials), Computer programs, Acoustic emissions, Ship plates.

The purpose of this work is to demonstrate the feasibility of using microprocessors in ultrasonic inspection. Benefits of employing a microprocessor are two-fold, the first with respect to the development of a small, compact and portable inspection device, and the second with respect to obtaining flaw data in digital format for use in structural mechanics computer programs for stress analysis.

COO-3158-64 PC **A02**/MF **A01**
Cornell Univ., Ithaca, NY. Dept. of Materials Science and Engineering.
Specimen-Exchange Device for an Ultra-High Vacuum Atom-Probe Field-Ion Microscope.
A. Wagner, T. M. Hall, and D. N. Seidman. Jul 78, 10p
Contract EY-76-S-02-3158

Descriptors: *Ion microscopes, Auxiliary systems, Laboratory equipment, Sample changers, Ultra-high vacuum.
Identifiers: ERDA/440400.

For abstract, see ERA citation 04:043707.

HEDL-SA-1630 MF **A01**
Hanford Engineering Development Lab., Richland, WA.
PMS: What Are You Getting for Your Money.
R. A. Rigney, and R. H. Campbell. 27 Sep 78, 12p CONF-7810120-1
Contract EY-76-C-14-2170
PMI seminar/symposium, Anaheim, CA, USA, 7 Oct 1978, Portions of document are illegible.
Microfiche copies only.

Descriptors: FFTF reactor, Hanford reservation, Contracts, Cost, Evaluation, Management.
Identifiers: ERDA/220600, *Performance evaluation, PMS system.

For abstract, see ERA citation 04:042973.

LBL-8129 PC **A04**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Optical Timing Receiver for the NASA Spaceborne Ranging System. Part II. High Precision Event-Timing Digitizer.
B. Leskovar, and B. Turko. Aug 78, 63p
Contract W-7405-ENG-48

Descriptors: *Digitizers, *Timing circuits, Design, Performance, Specifications.
Identifiers: ERDA/440300.

For abstract, see ERA citation 04:045299.

NUREG/CR-0910 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Pattern Recognition Methods for Acoustic Emission Analysis,
P. G. Doctor, T. P. Harrington, and P. H. Hutton. Jul 79, 58p PNL-3052
Contract DOE-EY-76-C-06-1830

Descriptors: *Nondestructive tests, Pattern recognition, Crack propagation, Elastic waves.
Identifiers: *Acoustic emission testing, Acoustic emissions.

Acoustic emissions are a type of nondestructive evaluation data that are noteworthy as a method of monitoring the condition of inservice structures. Models have been developed that relate the rate of acoustic emissions to structural integrity, but implementation of these techniques has been hindered by the noisy environment in which the data must be taken. When acoustic emissions from noncritical sources are recorded in addition to those produced by critical sources, such as flaws, it can lead to incorrect interpretation of the models. This report discusses a technique for prescreening acoustic events and filtering out those that are produced by noncritical sources. The methodology investigated is pattern recognition. Three different pattern recognition techniques were applied to a data set that consisted of acoustic emissions caused by crack growth and acoustic signals caused by extraneous noise sources.

PATENT-4 135 130
Not available NTIS
Department of Energy, Washington, DC.
Method of Testing Gas Insulated Systems for the Presence of Conducting Particles Utilizing a Gas Mixture of Nitrogen and Sulfur Hexafluoride.
Patent,
R. E. Wootton. Filed 29 Jun 77, patented 16 Jan 79, 4p PAT-APPL-811 230
Supersedes PAT-APPL-811 230-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Electrical insulators, *Gas-insulated cables, Gases, Mixtures, Nitrogen, Particles, Sulfur fluorides, Testing.
Identifiers: ERDA/200300, *Patents, Tests, Dielectric breakdown.

For abstract, see ERA citation 04:042854.

PB-298 373/2GA CP **T05**
National Bureau of Standards, Washington, DC. Inst. for Computer Sciences and Technology.
Computer Program Package for Metric Conversion.
Software,
Joseph O. Harrison, Jr. Jul 75, mag tape NBS/DF-79/002
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions. Price includes documentation, COM 75-10960.

Descriptors: *Software, *Metric system, Conversion, Magnetic tapes, Fortran.
Identifiers: Univac-1108 computers.

The programs in this package are designed to convert dimensions and other quantities appearing on engineering drawings from metric to U.S. customary units and vice versa. They were developed by Caterpillar Tractor Co. and General Motors Corporation. In addition to the programs themselves, the package contains documentation explaining how to get the programs running on different computers and how to use them, and test problems to permit users to verify that the programs run correctly on their own computers. The Caterpillar program converts 31 different metric units to their U.S. customary equivalents. In contrast, the General Motors programs convert in both directions but work with millimetres and inches only. The General Motors programs also use rounding conventions differing somewhat from those employed in the Caterpillar program. Both the Caterpillar and the General Motors programs are written in American National Standard Fortran and are suitable for use on a wide range of computers with little or no modification. The Caterpillar program is operated in batch mode while the General Motors programs are interactive...Software Description: The program is written in the Fortran programming language for implementation on a UNIVAC 1108 computer using the Execu 8 operating system. 64K bytes of core storage are required to operate the model.

PB-298 518/2GA PC **A02**/MF **A01**
Northrop Services, Inc., Research Triangle Park, NC.
X-Ray Fluorescence Analysis of Filter-Collected Aerosol Particles.
Journal article,
Thomas G. Dzubay, and Dwight G. Rickel. 1978, 10p EPA/600/J-78/120

Pub. in Jnl. Electron Microscopy and X-Ray Applications, p3-20, 1978.

Descriptors: *Gas analysis, *X ray fluorescence, *Particles, *Laboratory equipment, Air pollution, X ray analysis, Aerosols, Chemical analysis, Sampling, Air filters, Calibrating, Industrial hygiene.
Identifiers: *Air pollution detection, *Indoor air pollution, *Occupational safety and health, Reprints.

X-ray fluorescence (XRF) has become an effective technique for determining the elemental content of aerosol samples. For quantitative analysis, the aerosol particles must be collected as uniform deposits on the surface of Teflon membrane filters. An energy dispersive XRF spectrometer having a pulsed x-ray source that excites Ti, Mo, and Sm secondary targets has sufficiently low minimum detectable limits to enable 20-25 different elements to be detected and analyzed in atmospheric aerosol samples. For quantitative analysis using an energy dispersive spectrometer, the x-ray spectra are analyzed using a least squares procedure to eliminate interferences. Thin film standards are used to calibrate the spectrometer. Applications include the XRF analysis of 34,000 samples from the Regional Air Pollution Study in St. Louis.

PB-298 654/5GA Not available NTIS
National Bureau of Standards, Washington, DC.
An Electronic Ratio Error Set for Current Transformer Calibrations.
Final rept.,
Richard L. Kahler. Jun 79, 3p
Pub. in IEEE (Institute of Electrical and Electronics Engineers) Transactions on Instrumentation and Measurement. Short Papers IM-28, n2, p162-164, Jun 79.

Descriptors: *Comparators, Current transformers, Calibrating, Errors.
Identifiers: Reprints.

A direct-reading electronic ratio error set for current transformer calibrations is described. It is capable of generating direct and quadrature error currents from 1 ppm to 5 percent of transformer secondary currents up to 10 A. The uncertainty is less than one percent of the generated current. The set features electronic display of the direct and quadrature components with three digits each and is direct reading at 50, 60, and 400 Hz.

PB-298 661/0GA Not available NTIS
National Bureau of Standards, Washington, DC.
Optical Linewidth Measurement - A Basic Understanding.
Final rept.,
D. Nyyssonen, and J. M. Jerke. 1979, 16p
Pub. in Proceedings of the Microelectronics Measurement Technology Seminar Held at San Jose, CA. on February 6-7, 1979, p251-266 1979.

Descriptors: *Optical measuring instruments, Line width, Measurement, Masking, Integrated circuits, Wafers.

Optical systems used for micromeasurement of linewidths on integrated circuit photomasks and wafers have shown measurement differences as large as 1.0 micrometer. Modeling of the diversity of measurement methods used for edge detection has shown that these measurement differences may be attributed to both differences in the optical images formed by different microscope systems and differences in edge detection criteria. New techniques developed at NBS for accurate edge detection and calibration of optical linewidth measurement systems are discussed.

PB-298 809/5GA PC **A04**/MF **A01**
National Measurement Lab. (NBS), Washington, DC. Office of Nondestructive Evaluation.
A Comparison of American and European Ultrasonic Testing Standards,
Sam Golan. Aug 79, 74p* NBSIR-79-1790

Descriptors: *Ultrasonic tests, Standards, Comparison, Utilization, Evaluation.
Identifiers: *Foreign technology.

In this work twenty-seven general ultrasonic standards from eleven countries and international organizations were reviewed. Thirty-seven ultrasonic product standards from five countries were studied to evaluate the utilization of the general ultrasonic standards, i.e., to what extent the procedures outlined in the general standards are applied by the product standards.

15. MILITARY SCIENCES

15B. Chemical, Biological, and Radiological Warfare

AD-A070 678/8GA PC **A04**/MF **A01**
Midwest Research Inst Kansas City MO
Feasibility Studies on Enzyme Systems for Detector Kits.
Quarterly progress rept. no. 10, 28 Sep-28 Dec 78,
Louis H. Goodson, and Donald R. Seliers. Apr 79, 64p ARCSL-CR-79039, AD-E410 148
Contract DAAA15-76-C-0132
See also Quarterly progress rept. no. 9, AD-A066 105.

Descriptors: *Chemical agent detectors, Cholinesterase inhibitors, Sensitivity, Drinking water, Acetylcholinesterase, Cholinesterase, Fishes, Horses, Acetates, Thermal instability, Buffers(Chemistry), Stabilization, Storage, Incubation, GB agent, VX agent, Sodium compounds, Phosphates, Kits, Enzymes, Feasibility studies.
Identifiers: Sodium phosphate, Zwitterion buffers, Electric eels, Eels, Indoxyl acetate, Horse serum.

Sensitivity of eel acetylcholinesterase impregnated discs to inhibition by GB was enhanced by two approaches. Increasing the time for reaction between enzyme and nerve agent gave complete inhibition of 1.2 unit discs in 13 min by 0.005 micrograms GB/ml; decreasing the amount of enzyme impregnated in each disc to 0.8 unit/disc gave discs that were completely inhibited in 8 min by 0.005 micrograms GB/ml. However, discs made with only 0.8 units/disc failed to give good color intensities upon testing in the absence of agent after storage at 90 C for 5 days. Comparison of eel cholinesterase disc susceptibilities to inhibition by GB and VX showed that discs are inhibited 2-1/2 to 5 times faster with GB solutions than VX at 0.02 micrograms/ml. Enzyme discs made with sodium phosphate buffer were more sensitive to VX than discs made with PIPPS, Tris, or TES buffers. Enzyme discs, made with PIPPS, PIPES, and Gly-Gly buffers, were tested for high-temperature storage stability. Only discs prepared with 0.5 M PIPPS buffer produced good color intensities after storage for 5 days at 90 C. Although attempts at simplifying ticket manufacture by attaching discs to plastic supports using adhesives were of limited success, direct application of substrate solution to the plastic support in the absence of a substrate disc has promise.

AD-A070 749/7GA MF **A01**
System Sciences Inc Bethesda MD
Emergency Health Services in a Nuclear Attack Environment.
Final rept. 11 Apr 78-30 Jun 79,
Charles G. Anderson. 15 May 79, 172p
Contract DCPA01-78-C-0210
Availability: Microfiche copies only.

Descriptors: *Medical services, Health care facilities, Operational readiness, Postattack operations, Nuclear warfare casualties, Public health, Civil defense, Defense planning, Emergencies.
Identifiers: *Emergency medical services.

This project addresses the issues surrounding the preparedness status of the United States to cope with the health and medical care requirements in the event of a nuclear attack. To assess the current status of National preparedness, System Sciences, Inc. conducted a series of interviews with Federal and regional health and Civil Defense planners as well as with health department personnel in five states. The overall conclusion was that there is little or no Civil Defense related emergency health service planning activity at any level of government. (Author)

AD-A070 797/6GA PC **A02**/MF **A01**
Defence Research Establishment Suffield Ralston (Alberta)
Effect of a Water-Soluble Benzodiazepine, RO 21-3981 Upon GD-Induced Seizure Activity and Convulsions in the Monkeys.
Technical paper,
J. A. Lipp, and T. J. Dola. May 79, 14p Rept no. DRES-TP-498

Descriptors: *GD agent, *Cholinesterase inhibitors, Monkeys, *Antidotes, *Anticonvulsants, Convulsive disorders, Canada.
Identifiers: Diazepam, *Benzodiazepine anticonvulsants, Clonazepam, Laboratory animals.

Monkeys with chronic implanted cerebral electrodes were exposed to the cholinesterase inhibitor GD. At the onset of the GD-induced seizure activity and convulsions, the water-soluble benzodiazepine derivative RO 21-3981 and atropine were administrated by intravenous injection. There was an immediate suppression of the high voltage sharp wave and spike activity which was replaced by a high voltage, multiple sharp wave activity and all convulsive activity ceased. The animals appeared unresponsive. The bradycardia and dyspnea associated with GD-poisoning were reversed by the action of the atropine. All animals remained very sedate for 1 - 1 1/2 hours and were ataxic during the recovery period. (Author)

AD-A070 812/3GA PC **A02**/MF **A01**
SRI International Menlo Park CA
Studies of DIAL/DISC Remote Sensing Techniques for Chemical Agent Detection.
Quarterly progress rept. Jul-Nov 78,
M. L. Wright. Mar 79, 18p ARCSL-CR-79032
Contract DAAK11-78-C-0074

Descriptors: *Chemical agent detectors, *Nerve agents, *Carbon dioxide lasers, *Chemical agent simulants, *Remote detectors, GA agent, GB agent, GD agent, Vapors, Aerosols, Concentration(Chemistry), Range(Distance), Infrared lasers, Spectroscopy, Tables(Data).
Identifiers: Differential absorption lidar systems, Differential scatter lidar systems, DMMP chemical agent simulant, Optical radar.

The object of this project is to determine the ability of DIAL and DISC systems (both using a CO2 laser) to estimate the range and concentration of toxic chemical vapor and aerosol clouds. The project includes theoretical calculations of both DIAL and DISC systems and the preliminary experimental verification of the ability of a DIAL system to detect a volatile simulant. Spectral interference analyses were made for agents GA, GB, and GD and the simulant DMMP, and the results of these analyses are given. By proper wavelength selection, relatively interference-free operation can be obtained. Tables of the most favorable operating wavelengths are given in the report. (Author)

15C. Defense

AD-A070 724/0GA PC **A04**/MF **A01**
Pittsburgh Univ PA Univ Center for Social and Urban Research
National Perspectives on Civil Defense: 1978--Credibility and Acceptance.
Final rept.,
Jiri Nehnevajsa. Jan 79, 59p
Contract DCPA01-78-C-0218

Descriptors: *Civil defense, Crisis management, Acceptability, Relocation, Warning systems, National security, Evacuation, Surveys, Perception(Psychology).

In this preliminary assessment of credibility and acceptance issues as they bear on crisis relocation planning, the results of the late 1978 national survey form the major body of data on the basis of which the assessment is performed. This national probability sample included 1,620 Americans of 18 years of age and over and was conducted in the 48 contiguous states of the Union. The study defines credibility problems along four dimensions: credibility of threat, credibility of response (response effectiveness), credibility that the response (CRP) would be actually put to use (use credibility), and spin-off credibility (the potential payoff of such programs as CRP for other emergencies or activities).

15D. Intelligence

AD-A071 118/4GA PC **A06**/MF **A01**
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Industrial Engineering and Operations Research

Prediction of the Recognition of Real Objects as a Function of Photometric and Geometric Characteristics.
Technical rept. 16 Mar 74-15 Mar 75,
Deborah G. Bonnet, and Harry L. Snyder. Dec 78, 112p ARI-TR-78-TH7
Grant DAHC19-74-G-0009

Descriptors: *Target acquisition, *Aerial reconnaissance, Human factors engineering, Photometry, Densitometers, Air to surface, Mathematical prediction, Computer programs, Automatic, Analysis of variance, Regression analysis.
Identifiers: *Scence analysis.

The purpose of this research was to predict target-by-target acquisition performance of air-to-ground imagery from microdensitometrically determined photometric and geometric characteristics of the scene. Results showed that it is feasible to predict the ground range at which a given target will be detected by an airborne observer. This prediction could be made totally automatically, given reconnaissance imagery, a microdensitometer, and a small computer. Seventeen characteristics of targets, backgrounds, and target/background relationships which reliably correlate to target acquisition performance were identified. Sixty regression equations combining these variables into linear predictive models of target acquisition performance were developed from one set of targets and mission conditions and cross-validated against targets contained in three different reconnaissance missions.

15E. Logistics

AD-A070 588/9GA MF **A01**
National Defense Univ Washington DC Research Directorate
Defense Transportation Organization: Strategic Mobility in Changing Times.
Marshall E. Daniel, Jr. May 79, 118p Rept no. NATL SEC AFFAIRS MONO-79-3
Availability: Superintendent of Documents, GPO, Washington, DC 20402 HC $3.50. Microfiche furnished to DDC (and NTIS) users.

Descriptors: *Military transportation, Management, Mobility, National security, NATO, Strategic analyses, Marine transportation, Air transportation, Airlift operations, Land transportation, Ground traffic, Defense planning.

Partial contents: Defense Transportation by Sea; Defense Transportation by Air; Land Transportation and Traffic Management; Efforts to Improve Defense Transportation Management; and A Direction for the Future.

AD-A070 635/8GA MF **A01**
Office of Naval Research Arlington VA
Naval Research Logistics Quarterly. Volume 26, Number 2.
Jun 79, 102p
See also Volume 26, Number 1, AD-A069 026.
Availability: Superintendent of Documents, GPO, Washington, DC 20402 HC $4.10. Microfiche furnished to DDC and NTIS users.

Descriptors: *Naval logistics, *Logistics management, Periodicals, Naval research, Decision making, Mathematical models, Inventory control, Costs, Maintenance management, Queueing theory, Management planning and control, Operations research, Sampling.
Identifiers: Pricing, Goodness of fit, Expected value problems, Bayesian estimation.

Contents: Methodology for Studying the Dynamics of Extended Logistic Systems; A Three-Echelon, Multi-Item Model for Recoverable Items; Bayesian Estimation and Optimal Designs in Partially Accelerated Life Testing; Some Bayes Tests and their Asymptotic Properties for the Multivariate, Multisample Goodness-of-Fit Problem; Multiple-Attribute Decision Making With Partial Information--The expected-value criterion; Optimal State-Dependent Pricing Policies for a Class of Stochastic Multiunit Service Systems; On the First Time a Separately Maintained Parallel System has been Down for a Fixed Time; A Capacity-Expansion Model for Two Facility Types; On a Single-Server Queue With State-Dependent Service; Approximation Techniques in the Solution of Queueing Problems; Distribution of Sample Correlation Coefficents; Optimal Project Compression with Due-Dated Events; New Analysis of a Lot-Size Model with Partial Backlogging; Optimal Betting Strategies for Favorable Games; and Some Simple Victory-Prediction Conditions for Lanchester-Type Combat between Two Homogeneous Forces with Supporting Fire.

AD-A070 813/1GA PC **A03**/MF **A01**
Naval Postgraduate School Monterey CA
Experimental Availability Tables for Finite Spares Backlog.
Master's thesis,
Kil Ju Park. Mar 79, 37p

Descriptors: *Spare parts, *Inventory analysis, Operational readiness, Repair, Replacement, Mathematical models, Tables(Data), Failure, Replenishment, Rates, Approximation(Mathematics), Maintenance management, Theses.

Experimental tables of availabilities at time t are obtained for a device whose performance is described by an alternating renewal process with a finite number of failure-renewal cycles, corresponding to having a finite spares backlog. Failure and repair rates are assumed to be constant, and attention is restricted to cases in which the repair rate is larger than the failure rate. (Author)

AD-A070 858/6GA PC **A04**/MF **A01**
Civil Engineering Lab (Navy) Port Hueneme CA
MARCORPS Laundry/Shower Module - Washing and Drying Test Program.
Technical note Oct 76-Oct 77,
Theodore A. Kuepper, and Deh Bin Chan. Feb 79, 56p Rept no. CEL-TN-1547

Descriptors: *Laundry operations, Drying apparatus, Military hygiene, Washers(Cleaners), Marine Corps, Sanitation, Test and evaluation, Test methods, Shower facilities.

The washing and drying test programs conducted during FY-77 for the Marine Corps laundry/shower module project are described. A washing and drying method is chosen which allows continuous laundering of field utility clothing within a 5-minute retention time. Wastewater recycling alternatives are also described. (Author)

AD-A071 036/8GA PC **A07**/MF **A01**
Air Force Academy CO
Determining Government Disbursements from Normalized Spending Patterns.
Final rept.,
William J. Weida, Steven D. Clark, and James E. Rowland. May 79, 138p Rept no. USAFA-TR-79-4

Descriptors: *Government procurement, *Air Force procurement, Economics, Air Force planning, Cost analysis, Computer programs, Forecasting, Operations research.
Identifiers: *Government expenditures.

These models are the culmination of an attempt to model the disbursement and reimbursement process in the Air Force. Data from every major treasury code category were gathered and investigated. It was determined that total yearly disbursements and reimbursements in each category possessed so many random effects that accurate modelling was not possible. However, when the data was separated into fiscal year monies in each treasury code category, the ability to model the data changed completely. The fiscal year disbursement and reimbursement data showed that, in each case, monies were expended in an S-shaped, cumulative expenditure pattern over the spendout period. Forecasts from these separate fiscal year curves were then combined to establish the forecast outlays in each treasury code category by month. To fit the S-shaped fiscal curves, a method of splitting the curve at its inflection point and fitting both halves separately was developed. The end result was the construction of successful models for forecasting monthly outlays in every treasury code category of Air Force spending. (Author)

AD-A071 074/9GA PC **A07**/MF **A01**
Naval Postgraduate School Monterey CA
Backlog of Maintenance and Repair (BMAR) at PWC San Diego Definition and Methodology for Reduction.
Master's thesis,
James Walter Owens, II, and Robert Larry Schultz. Mar 79, 150p

Descriptors: *Maintenance, *Repair, *Naval shore facilities, Costs, Investments, Life cycle costs, California.
Identifiers: *Public works, San Diego(California).

For many years the Naval Shore Establishment has experienced funding shortfalls in the area of real property maintenance. As a result, the Backlog of Maintenance and Repair (BMAR) projects has increased at a steady rate with the total now approaching 550 million dollars. There was growing concern at the CNO and Congressional levels that maintenance deficiencies have significantly reduced the Navy's capability to meet its national defense mission. This thesis explores the Public Works Center, San Diego BMAR in some detail addressing such areas as definition, generation, accuracy, and true magnitude. Once this concept has been fully developed, long range facilities maintenance planning, including potential fund sources and programs which could be utilized in reducing the BMAR to zero are explored. Lastly, the question of minimum cost of ownership is discussed with a viewpoint toward identifying a reasonable annual maintenance funding level which will prevent the growth of any BMAR.

AD-A071 134/1GA PC **A05**/MF **A01**
Army Tropic Test Center APO Miami 34004
Methodology Investigation. Moisture and Temperature Conditions in Storage Containers in Humid Environments.
Final rept., Feb 76-Feb 77,
Wilfried H. Portig. Dec 78, 82p Rept no. USATTC-78090

Descriptors: *Storage, *Containers, *Tropical tests, Moisture, Humidity, Tropical regions, Panama, Damage, Environmental tests, Condensation, Temperature.
Identifiers: Tropic Test Center.

A methodology investigation was initiated by the USATTC in the Canal Zone in February 1976 to provide a further understanding of the basic processes that lead to water damage of material in storage containers, and to enhance knowledge of thermal buildup on surfaces and in the air inside storage containers. The investigation revealed that moisture conditions inside storage containers were influenced significantly by the materials inside those containers. With increasing temperature, the materials were found to rapidly release moisture to the container air significantly changing the moisture content (absolute humidity) of the air and increasing the potential for water condensation when radiation cooling of the contents and walls of the container occurred. To reduce the occurrence of water damage in storage containers, the study recommends that the amount of water initially enclosed in a container by minimized by (1) pre-drying the goods to be stored, (2) pre-drying the materials (e.g., pallets and packaging material) associated with the storing of goods and (3) closing the container in dry ambient environment. Further study of the basics of moisture migration within storage containers is also recommended. (Author)

AD-A071 139/0GA PC **A03**/MF **A01**
Cornell Univ Ithaca NY School of Operations Research and Industrial Engineering
Coordination of Production Schedules with Shipping Schedules.
Technical rept.,
W. L. Maxwell, and J. A. Muckstadt. Apr 79, 31p Rept no. TR-422
Contract N00014-75-C-1172

Descriptors: *Shipping, *Scheduling, Logistics, Production, Mathematical models, Algorithms, Assembly, Automotive vehicles.

Scheduling logistics operations in a multi-echelon production system requires planning and coordinating production and transportation decisions for all facilities in a system. In this paper we show how these decisions can be made in an actual multi-facility system consisting of a component plant, at

which products are produced, and a set of destinations, at which the end product, automobiles, are assembled. An assembly schedule for automobiles is specified in advance for each week in a planning horizon. The component plant is required to produce and ship the correct mix of products to each destination to meet this automobile assembly schedule on time. Our objective is to develop models and an algorithm that can be used to determine what products should be produced on the various productionlines at the component plant during each period (either a shift or a week), what portion of a period's production and inventory on-hand at the beginning of a period at the component plant should be loaded into rail cars and shipped to the various destinations, and what portion of a period's production should be held in inventory at the component plant into the next period so as to minimize the appropriate costs subject to constraints on production and shipping. The structure of the problem is examined and is exploited in the proposed algorithm. (Author)

PB-298 538/0GA Mag Tape $2300.00
Defense Logistics Services Center, Battle Creek, MI.
Master Cross Reference List, Part 1.
Data file,
Burdette Pederson, and Trudy Sievking. Oct 79, mag tape DSA/DF-79/014
Supersedes rept. no. DSA/DF-79/C09, PB-295 125.
Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape. Identify recording mode desired by specifying character set, track, density, and parity. Call NTIS Computer Products if you have questions.

Descriptors: *Data file, *Logistics management, Inventory control, Supply management, Magnetic tapes, Federal cataloging system, Federal supply classification.
Identifiers: Cross reference lists.

Part 1 of the Master Cross Reference List is a master list of Logistics Reference Numbers cross-referenced to their applicable National Stock Number(s) in the Federal Catalog System. It contains four basic elements of data: (1) Logistics Reference Number, assigned by the manufacturers; (2) Manufacturers Code identifying the manufacturer; (3) Reference Number Variation Code, indicating whether the reference number is item identifying or requires additional data to correctly identify the item of supply; and (4) National Stock Number/ Permanent System Control Number.

PB-298 727/9GA PC **A03**/MF **A01**
General Accounting Office, Washington, DC. Procurement and Systems Acquisition Div.
Army Procurement of 10kW, 60Hz Gas Turbine Generators is Highly Questionable.
Report to the Congress.
9 Aug 79, 30p PSAD-79-95

Descriptors: *Army procurement, *Turbogenerators, Gas turbine power generation, Military requirements, Assessments, Benefit cost analysis.

A 10-kilowatt (kW), 60-hertz (Hz) gas turbine generator which the Army plans to buy does not meet the Army's requirements. Its reliability is too low, fuel consumption too high, and life-cycle cost excessive. The Army could save from $275 million to $1.6 billion over 20 years if it purchased diesel generators instead of 5,938 10kW gas turbines. GAO recommends that the Army (1) purchase diesel generators instead of gas turbines for its 10kW power requirements and (2) evaluate using 5kW diesel and gasoline generators instead of 10kW gas turbines for its 5kW power requirements.

15F. Nuclear Warfare

UCRL-81771 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Fast Recovery Strain Measurements in a Nuclear Test Environment.
W. R. Kitchen, W. J. Nauman, and D. W. Vollmer. 30 Apr 79, 25p
Contract W-7405-ENG-48

Descriptors: *Materials, *Nuclear explosions, *Strain gages, Data acquisition, Design, Nuclear weapons, Physical radiation effects, Underground explosions.
Identifiers: ERDA/450202, ERDA/360106, ERDA/440300.

For abstract, see ERA citation 04:041576.

15G. Operations, Strategy, and Tactics

AD-A070 787/7GA PC **A03**/MF **A01**
Command and Control Technical Center Washington DC
The CCTC QUICK-Reacting General War Gaming System (QUICK) Users Manual. Volume III. Weapon Allocation Subsystem. Change 1.
14 Jun 79, 49p Rept no. CCTC-CSM-UM-9-77-V3-CH-1
Change 1 to Rept. no. CCTC-CSM-UM-9-77-VOL-3, AD-A055 848.

Descriptors: *War games, Command and control systems, Allocations, Computerized simulation, Nuclear warfare, Data management, Computer programs, Weapons, Resource management.
Identifiers: QUICK(Quick Reacting General War Gaming System).

No abstract available.

AD-A070 802/4GA PC **A03**/MF **A01**
Army Russian Inst APO New York 09053
The Soviet Navy in Theory and Practice.
Student Research rept.,
George M. Connell. 1979, 37p

Descriptors: *Naval operations, USSR, Military forces(Foreign), Naval intelligence, Missions, Comparison, Military doctrine, Naval aviation, Construction.

In an effort to determine the wartime missions of the Soviet Navy and its ability to fight at various levels of conflict, the author compares the doctrinal writings of Admiral Sergei Gorshkov with the naval construction programs that have taken place during his twenty-three years as Commander-in-Chief. The author concludes that Gorshkov has successfully accomplished his strategic attack mission by building a ballistic missile submarine force that will be protected in wartime by naval aviation and a surface and subsurface covering fleet. At the same time, Gorshkov has continued to attempt to solve the increasingly difficult problem of strategic defense through extensive research in strategic antisubmarine warfare. While a fixed percentage of the total military budget has affected the construction of ships that would complement other forms of naval warfare, Gorshkov has also achieved a substantial ability to fight at sea during non-strategic conflicts. (Author)

AD-A070 842/0GA PC **A05**/MF **A01**
Command and Control Technical Center Washington DC
The CCTC Quick-Reacting General War Gaming System. (QUICK). Users Manual. Volume 1. Data Management Subsystem. Change 2.
May 79, 82p Rept no. CCTC-CSM-UM-9-77-V1-CH-2
Change 2 to report dated 1 Jun 77, AD-A047 256.

Descriptors: *War games, Data management, Command and control systems, Strategic warfare, Targeting, Instruction manuals, Computer programs, Computerized simulation, User needs.
Identifiers: QUICK(Quick Reacting General War Gaming System).

No abstract available.

AD-A070 843/8GA PC **A03**/MF **A01**
Command and Control Technical Center Washington DC
The CCTC Quick-Reacting General War Gaming System. (QUICK). Users Manual. Volume IV. Sortie Generation Subsystem. Change 1.
May 79, 40p Rept no. CCTC-CSM-UM-9-77-V4-CH-1
Change 1 to report dated 15 Apr 78, AD-A057 232.

Descriptors: *War games, Command and control systems, Resource management, Computerized simulation, Nuclear warfare, Strategic warfare, Data management, Computer programs, Instruction manuals, User needs.
Identifiers: Sorties, QUICK(Quick Reacting General War Gaming System).

No abstract available.

AD-A070 942/8GA PC **A02**/MF **A01**
Army Infantry School Fort Benning GA
Opposing Forces Bibliography. Part I: Soviet Military Capabilities.
1978, 14p Rept no. SPECIAL BIB-1-PT-1
See also Part 2, AD-B038 598L.

Descriptors: *Bibliographies, *Military forces(Foreign), *USSR, China, Military strategy, Military doctrine, Military intelligence, Policies, Nuclear warfare, Military forces(United States), Weapons.

The Bibliography is published to support the United States Army Infantry School (USAIS) RED THREAT TEAM. (Author)

AD-A070 958/4GA MF **A01**
Army Electronics Research and Development Command White Sands Missile Range NM Atmospheric Sciences Lab
KWIK: An Algorithm for Calculating Munition Expenditures for Smoke Screening/Obscuration in Tactical Situations.
Technical rept.,
Robert K. Umstead, Ricardo Pena, and Frank V. Hansen. Apr 79, 82p Rept no. ERADCOM/ASL-TR-0030
Availability: Microfiche copies only.

Descriptors: *Smoke screens, *Firing rates, *Meteorological data, *Computer programs, Smoke projectiles, Turbulent diffusion, Obscuration, Tactical analyses, Algorithms, Flow charting, Fortran, Diffusion theory.
Identifiers: HPL programming language, BASIC programming language, KWIK computer program.

KWIK, an algorithm for calculating munition expenditures for smoke screening/obscuration in tactical situations, is described. Nine basic meteorological inputs plus fundamental definitions of meteorological optics and Gaussian diffusion theory are utilized in the approach. A flowchart of the algorithm is also given with the software program listing in FORTRAN, BASIC, and HPL programming languages. (Author)

AD-A071 031/9GA PC **A03**/MF **A01**
Command and Control Technical Center Washington DC
The CCTC Quick-Reacting General War Gaming System (QUICK). Users Manual. Volume II. Weapon/Target Identification Subsystem. Change 2.
19 Jun 79, 30p Rept no. CCTC-CSM-UM-9-77-V2-CH-2
Change 2 to report dated 1 Jun 77, AD-A046 088.
See also Change 1, AD-A056 204.

Descriptors: *War games, Computer programming, Instruction manuals, Input, Resource management, Quick reaction, Nuclear warfare, Fortran.
Identifiers: QUICK(Quick Reacting General War Gaming System).

No abstract available.

AD-A071 135/8GA PC **A03**/MF **A01**
RAND Corp Santa Monica CA
Overview of the Air-Ground Actions Two-Sided Engagement (AGATE) Simulation Model.
Interim rept.,
Jack Raymond Lind. Apr 79, 49p Rept no. RAND/R-2379-AF
Contract F49620-77-C-0023

Descriptors: *Tactical warfare, *Computerized simulation, Attack, Air to surface, Air defense.
Identifiers: *AGATE model, *Engagement models, Scenarios.

AGATE is a dynamic, two-sided, expected-value, combat-interaction model of ground battle, including air attacks on ground targets and counterair defenses by ground forces. It is designed to meas-

ure the impact of (a) weapon system characteristics, (b) organizational structure, (c) doctrine and tactics, and (d) terrain and environment on the outcome of battles. The tanks, armored personnel carriers (APCs), artillery, air, and counterair systems that make up the combined arms team, together with the battle plans of each weapon system, are brought together in the model so that the contribution of each to the outcome of battles and firefights can be examined.

AD-A071 165/5GA MF **A01**
Department of the Air Force Washington DC
Long-Range Missile-Equipped. A Soviet View,
B. A. Vasil'yev. 1972, 84p
Trans. of Soviet Military Thought, 1972.
Availability: Superintendent of Documents, GPO, Washington, DC 20402 HC $3.25. Microfiche furnished to DDC (and NTIS) users.

Descriptors: *Air Force operations, USSR, Jet bombers, Guided missiles, Air launched, History, Strategic weapons, Military forces(Foreign), Translations.

No abstract available.

16. MISSILE TECHNOLOGY

16D. Missiles

AD-A071 129/1GA PC **A07**/MF **A01**
Advisory Group for Aerospace Research and Development Neuilly-sur-Seine (France)
Guidance and Control for Tactical Guided Weapons with Emphasis on Simulation and Testing.
Lecture series.
May 79, 145p Rept no. AGARD-LS-101
Presented at the Guidance and Control Panel and the Consultant and Exchange Programme of AGARD, 4-5 Jun 79, Rome (Italy), 7-8 Jun 79, Ankara (Turkey) and 11-12 Jun 79, Eglin, FL.

Descriptors: *Air to surface missiles, *Tactical weapons, Weapon delivery, Terminal guidance, Simulation, Flight control systems, Target acquisition, Bibliographies.

Contents: Tactical Missile Performance Requirements - A Methodology for Development; Weapon Delivery and its Evaluation; New Methods in the Terminal Guidance and Control of Tactical Missiles; Guidance Simulation Techniques; Missile Guidance Techniques; Testing of Missile Guidance and Control Systems; Bibliography.

NTIS/PS-79/0906/2GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Closed Loop Control Systems. Part 2. Miscellaneous Applications. Volume 2. 1978-July, 1979 (A Bibliography with Abstracts).
Rept. for 1978-Jul 79,
Guy E. Habercom, Jr. Sep 79, 95p
Supersedes NTIS/PS-78/0810 and NTIS/PS-77/0801. Updates NTIS/PS-75/364.

Descriptors: *Bibliographies, *Feedback control, Automatic control, Adaptive systems, Spacecraft guidance, Missile guidance, Lasers, Wind tunnels, Abstracts.
Identifiers: *Closed loop systems.

Closed loop control systems are investigated relevant to design, application, and performance. Such diversified applications as gas turbine engine controls, feedback control of spacecraft and missiles, wind tunnel flow control, and feedback control of laser pulses are examined. (This updated bibliography contains 88 abstracts, 64 of which are new entries to the previous edition.)

N79-28139/0GA PC **A15**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Pressure Distributions on Three Different Cruciform Aft-Control Surfaces of a Wingless Missile at Mach 1.60, 2.36, and 3.70. Volume 2: Clipped delta Tail.
M. Lamb, W. C. Sawyer, D. L. Wassum, and C. D. Babb. Aug 79, 345p NASA-TM-80097-V-2, L-12993-V-2

Descriptors: *Control surfaces, *Missile configurations, *Pressure distribution, *Tail assemblies, Wind tunnel tests, Plotting, Slender bodies, Supersonic speeds, Tables (Data).

For abstract, see STAR 1719

N79-28140/8GA PC **A15**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Pressure Distributions on Three Different Cruciform Aft-Tail Control Surfaces of a Wingless Missile at Mach 1.60, 2.36, and 3.70. Volume 3: Cranked Tail.
M. Lamb, W. C. Sawyer, D. L. Wassum, and C. D. Babb. Aug 79, 342p NASA-TM-80097-V-3, L-12993-V-3

Descriptors: *Control surfaces, *Missile configurations, *Pressure distribution, *Tail assemblies, Wind tunnel tests, Plotting, Slender bodies, Supersonic speeds, Tables (Data).

For abstract, see STAR 1719

PATENT-4 156 752 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
Fire Protection Covering for Small Diameter Missiles.
Patent,
S. R. Riccitiello, and P. M. Sawko. Filed 25 Nov 77, patented 29 May 79, 7p N79-26100/4, PAT-APPL-854 920.
Supersedes PAT-APPL-854 920-77, N78-13110 (16 - 03 p 0437).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: *Epoxy compounds, *Fireproofing, *Missiles, *Protective coatings, Ammonium compounds, Nonflammable materials, Particle size distribution, *Patents, Sheets, Sulfides.
Identifiers: PAT-CL-428-220.

Flexible intumescent protection sheeting of unusually uniform thickness were prepared from epoxy-polysulfide compositions, containing microfibers and the ammonium salt of 1,4-nitroaniline-2-sulfonic acid, as disclosed in U.S. Pat. No. 3,663,464, except that an ammonium salt particle size in the order of 5 to 8 microns and a fiber size of about 1/128th inch in length and 3 to 5 microns in diameter were found critical to obtain the required density of 1.46 to 1.50 g/cc. The insulation sheeting was prepared by a continuous process involving vacuum mixing, calendering, and curing under very strict conditions which depend to some extent upon the thickness of the sheet produced.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A070 540/0GA PC **A03**/MF **A01**
Naval Ocean Systems Center San Diego CA
Likelihood Filtering of Passive Ambiguity Surfaces.
Research rept. Dec 77-Sep 78,
S. J. McCarthy. Feb 79, 34p Rept no. NOSC/TR-408
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Sonar signals, *Signal processing, Cross correlation, Signal to noise ratio, Spectrum analysis, Adaptive filters, Algorithms, False alarms, Probability density functions, Asymptotic series.

The likelihood ratio techniques for conducting cross-correlation processing under conditions of unknown signal and noise spectral properties are investigated. The forms of the likelihood ratio processors are presented and their statistics developed. The statistics, in the form of receiver operating characteristics, are used to compare the likelihood ratio techniques against a normalized cross correlation. The likelihood ratio techniques are shown to be advantageous if the spectral properties of either the signal or the noise vary across the processing bandwidth. (Author)

AD-A070 727/3GA PC **A02**/MF **A01**
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Economics
Bearing Estimation Using a Perturbed Linear Array,
Melvin J. Hinich. 30 Apr 76, 6p Rept no. TR-5
Contract N00014-75-C-0494
Pub. in Jnl. of the Acoustical Society of America, v61 n6 p1540-1544 Jun 77.

Descriptors: *Direction finding, *Linear arrays, Towed arrays, Beam forming, Reprints.
Identifiers: Maximum likelihood estimation.

No abstract available.

AD-A070 943/6GA PC **A02**/MF **A01**
Utah Univ Salt Lake City Dept of Mathematics
The S-Matrix and Sonar Echo Structure.
Technical summary rept.,
Calvin H. Wilcox. Jun 79, 21p Rept no. TR-35
Contract N00014-76-C-0276

Descriptors: *Sonar echoes, S matrix, Waveforms, Sonar pulses, *Acoustic scattering, Differential cross sections, Fourier transformation, Far field, Plane waves, Eigenvalues.

Pulse mode sonar operation is analyzed under the physical hypotheses that the medium is a stationary homogenous fluid; both the sonar system and the scattering objects are stationary; the scattering objects are rigid bodies; and the scattering objects lie in the far field of the transmitter and receiver.

AD-A070 963/4GA PC **A03**/MF **A01**
Texas Univ at Austin Applied Research Labs
Experimental Superposition of Acoustic Fields for Detection Performance Studies.
Technical memo.,
Jack A. Shooter, and Milton L. Gentry, Jr. 15 Mar 79, 34p Rept no. ARL-TM-79-3
Contract N00039-78-C-0307

Descriptors: *Acoustic detection, *Acoustic fields, Acoustic signals, Signal to noise ratio, Ambient noise, Background noise, Acoustic measurement, Acoustic data, Atlantic Ocean, Deep oceans, Omnidirectional, Hydrophones.

The concept of superimposing a target acoustic field onto an independent noise acoustic field is discussed and sample results are presented using data from the deep Atlantic Ocean. The purpose is to explore the principles and methods of how this concept can be implemented for assessing signal detection in the presence of noise as applied to particular systems. The target signal was composed of high and low level components which were used simultaneously. From these data, the high level signal was scaled down in amplitude and reinserted into the noise spectrum. The detection results of the actual low level signal and the reconstructed low level signal are compared and the results are shown to be essentially the same. (Author)

AD-A071 133/3GA PC **A07**/MF **A01**
Naval Postgraduate School Monterey CA
An Introduction to the Sonar Equations with Applications (Revised),
Alan B. Coppens, Harvey A. Dahl, and James V. Sanders. Feb 79, 144p Rept no. NPS-61-79-006
Revision of Rept. no. NPS-61SD-76-071, AD-A030 034.

Descriptors: *Sonar, *Underwater acoustics, *Antisubmarine warfare, Sound transmission, Propagation, Attenuation, Underwater sound, Acoustic attenuation, Equations.
Identifiers: Sonar equations.

This report provides an introduction to the Sonar equations for those interested in underwater sound as applied to ASW but lacking either the mathematical background or the time for a more rigorous presentation. While this material should be supplemented by lectures or a study guide, we have attempted to design the material so that it is reasonably self-explanatory, communicating many of the essentials concepts without requiring extensive verbal amplification. The unusual format has been deliberately chosen to facilitate these goals,

and our experiences in presenting these materials have seemed to justify this choice. It is assumed that the reader has some familiarity with trigonometric functions and either has or will develop will the aid of the appendix the facility of handling scientific notation and logarithmic operations.

AD-A071 173/9GA PC **A02**/MF **A01**
Lockheed-California Co San Diego Oceanics Div
Sonar Range Prediction Feasibility Study.
Final rept. 22 Apr 66-21 Dec 67,
Robert M. Lesser. 21 Dec 67, 22p Rept nos. LR-21194, LAC-619248
Contract NOBsr-95258

Descriptors: *Underwater acoustics, Acoustic velocity, Mathematical prediction, Sea water, Temperature, Profiles, Bathythermograph data, Sonar targets, Range(Distance), Submarine detection, Probability, Search sonar.
Identifiers: MOST project-1, AN/SQS-23, Sonar.

This report presents the results of a study to determine the feasibility of a sonar range prediction system based on a graphical presentation of profiles of expected range. The effects of changes in gradient and layer depth on expected range were studied. Two BT classification systems were studied to determine their application to a range prediction system. Because the gross features of the classification systems and the uncertainties of range prediction models, it is concluded that a range prediction system such as the type studied here is not feasible at this time. (Author)

AD-A071 175/4GA PC **A04**/MF **A01**
Texas Univ at Austin Applied Research Labs
Quarterly Progress Report Number 2, 1 April-30 June 1969.
11 Nov 69, 62p
Contract N00024-69-C-1129

Descriptors: *Sonar signals, *Sonar sound analyzers, Signal processing, Sonar personnel, Auditory perception, Sonar targets, Target recognition, Naval training, Target classification, Automation, Computer programming, Autocorrelation, Cross correlation.
Identifiers: MOST project-3, AN/SQS-23.

No abstract available.

AD-A071 181/2GA PC **A03**/MF **A01**
Navy Electronics Lab San Diego CA
An Evaluation of the Operational Effectiveness of the Proposed Pair Automatic Non-Alerting Transmission Modes.
Technical memo.,
C. H. Sturtevant, W. H. Frye, and L. A. Harvey. 3 Jun 66, 50p Rept no. NEL-TM-942

Descriptors: *Sonar, Acoustic detection, Operational effectiveness, Automatic, Warning systems, Sound transmission, Dual mode, Tactical analyses, Methodology.
Identifiers: PAIR sonar, MOST project-1, AN/SQS-23, Mark-111 fire control systems, Mark-114 fire control systems.

Studies have been conducted in response to a request for analysis of the following AN/SQS-23 PAIR program tasks(1) Analyze the operational effectiveness of the proposed PAIR automatic non-alerting modes under a variety of tactical situations. (2) From a tactical standpoint, determine how much a ship compromises its situation by: alerting, giving range, and giving own heading. (3) Analyze the ability of PAIR to interface properly with ASROC (Mk 111 and Mk 114) when in the non-alerting modes, i.e., adequate data rates, tracking accuracies, etc. (4) Determine minimum ship spacing with PAIR.

AD-A071 183/8GA PC **A03**/MF **A01**
Texas Univ at Austin Applied Research Labs
Quarterly Progress Report Number 2. 1 April - 30 June 1971.
16 Dec 71, 49p
Contract N00024-71-C-1185

Descriptors: *Target classification, Sonar targets, Antisubmarine warfare, Submarine detection, Acoustic detection, Beam forming, Reverberation, Sonar personnel, Performance(Human), Target strength, Cross correlation.
Identifiers: MOST project-3, Computer programming.

Work during this quarter primarily concerned various aspects of the hardware and software associated with a single-target classifier. Additional work is reported concerning split-beam processing, studies of reverberation and target statistics, and operator and committee activities. (Author)

AD-A071 184/6GA PC **A02**/MF **A01**
Altec Service Corp New York
Comments on ALTEC Service Corporation Low Frequency Transducer Development Project.
Ralph S. Woollett. 1957, 7p USL-TM-1150-21-55
Contract NObsr-57261

Descriptors: *Sonar transducers, Performance(Engineering), Frequency response, Q factors.
Identifiers: MOST project-4.

Altec Service Corporation's Interim Development Report dated 16 July 1954 contains transducer performance estimates which appear to the writer to be in error. The discrepancies noted for the case of the 1000 c.p.s unit operating alone are relatively minor. In the case of the 1000 c.p.s. unit operating in the complete array, however, the discrepancies are serious and indicate that the overall performance is much poor than the contractor predicts.

AD-A071 185/3GA PC **A02**/MF **A01**
Texas Univ at Austin Applied Research Labs
Next Generation Depth Sounder.
Quarterly progress rept. no. 1, 27 Sep-27 Dec 73,
Eugene Blum, James E. Hocker, and B. Paul Guyton. 8 Mar 74, 18p
Contract N00024-74-C-1069

Descriptors: *Depth finding, *Acoustic detection, Sounding, Sonar, Retrofitting, Modification kits, Performance tests.
Identifiers: MOST project-3, AN/BQN-17, AN/UQN-1, AN/UQN-4.

The first part of this report describes continued technical monitoring of the AN/UQN-1,4 retrofit kit procurement. The second item covers work on developing a high frequency transducer for the Next Generation Depth Sounder (NGDS). Two preliminary designs are to be tested. One is a 7-element mosaic of 7/8 in. ceramic discs arranged in a circular pattern, with a center element surrounded by six outer elements. The other is a 3 in. diam ceramic disc that is diced by cutting part way through the element of a rectangular grid pattern. A housing for these elements will consist of a standard AN/UQN-4 transducer housing that will also contain six mass-loaded 12 kHz elements of a type already used by the AN/UQN-4. The 12 kHz elements will surround the centrally located high frequency element. Preliminary efforts have been directed toward obtaining acoustic signal and noise data from AN/UQN-4 depth sounders to ascertain the operating environment within which the signal processor must function.

AD-A071 186/1GA PC **A02**/MF **A01**
Dalmo Victor Co Belmont CA
CHIRP Versus BURST Sonar Resolution Techniques for Classification during Detection,
Richard E. Baker. 1969, 10p Rept no. R-2850-3003

Descriptors: *Sonar pulses, Pulse compression, Search sonar, *Signal processing, Burst transmission, Sonar targets, Target classification, Submarine detection, Resolution, Transfer functions.
Identifiers: MOST project-3, Chirp sonar.

A previous Dalmo Victor report, R-2850-2931, proposed the CHIRP pulse compression technique as most adequately resolving detection range, classification and range rate problems for search sonars. This report qualitatively evaluates the effects of propagation non-linearities and Fresnel zone target scattering interference on CHIRP resolution. Comparisons are made to a BURST short pulse train system. For equal resolution, both techniques require equal bandwidths and similar spectral amplitude distributions. BURST resolves signals from different range cells by phase or time difference alone; CHIRP by both time and frequency. Propagation non-linearities cause similar coherence loss and resolution broadening. Scattering is a linear process. CHIRP resolves overlapping long pulse echoes by superposition of time-frequency separated signals. It is concluded that CHIRP provides resolution equivalent to BURST for a given sonar bandwidth. CHIRP permits use of a long, low data rate, detection pulse. In addition, the coherent integration used in a CHIRP system provides a greater target detection range than can be achieved with the non-coherent integration used in a BURST system, for the same average power. CHIRP also permits removal of range rate by triggering the classification display sweep at receipt of the first compressed CHIRP echo.

AD-A071 187/9GA PC **A02**/MF **A01**
Dalmo Victor Co Belmont CA
High Resolution Target Classification for the SQS-26 Sonar Equipment,
Richard E. Baker. 11 Feb 63, 20p Rept no. R-2850-3099
See also Rept. no. R-2850-3062, AD-A071 234.

Descriptors: *Target classification, *Sonar sound analyzers, Submarine detection, High resolution, Spectrum analyzers, Pulse compression, Quick reaction, Correlation techniques, Ambient noise, Target discrimination.
Identifiers: MOST project-3, *AN/SQS-26.

This report is concerned with the mechanization of the SQS-26 Sonar Equipment to provide the facility for target classification with the high range resolution scattering clue. High range resolution can provide an effective means for rapidly classifying sonar targets. Considerable information about the physical properties of sonar targets can be obtained from the facility for comparing the signal strengths received from closely spaced range cells. The regularity of large surfaces on submarines will produce a high degree of correlation of their back scattered signal amplitudes from adjacent high resolution range cells. The random distribution of the discrete scatterers in a fish school will produce decorrelation between their back scattered signals.

AD-A071 190/3GA PC **A03**/MF **A01**
Tracor Inc Austin TX
A Null Steering Technique for Interference Rejection.
Technical note.
1969, 48p Rept no. TRACOR-69-267-U

Descriptors: *Sonar arrays, Beam forming, Target discrimination, Nulls(Amplitude), Signal to noise ratio, Dynamic range, Masking, Countercountermeasures, Noise reduction, Target classification, Acoustic signatures, Processing, Schematic diagrams.
Identifiers: MOST project-3, *Signal processing, Interference.

Plane wave interfering sources have long posed problems to our sonar signal processors' performance. As sonar systems are improved and detection ranges become longer, this increased sensitivity to targets also implies an increased sensitivity to interference. Since both are plane waves which propagate across the array, and since the basic purpose of beamforming is to discriminate against the spatially incoherent noise and enhance coherent plane waves, it might at first seem to be a rather hopeless situation. However, the supposition in beamforming, as in all signal processing, is simply to discriminate against signal and noise based upon the differences between their spatial and temporal characteristics. It is possible, in general, to discriminate against signal noise (or as the case may be, to discriminate against signal-plus-noise and noise only) based upon spectral, waveform, statistical, and spatial organization differences. The interference problem may be treated in any or all of these categories.

AD-A071 191/1GA PC **A03**/MF **A01**
Tracor Inc Austin TX
Some Computed Effects of Assumed Inoperative Transducer Staves on Beam Formation and SSI Performance in the AN/SQS-26 (XN-2) Sonar Equipment.
Technical note,
G. T. Kemp, E. A. Tucker, and J. M. Young. 29 Jan 64, 42p Rept no. TRACOR-63-285-C

Contract NObsr-91039
Includes envelope with chart.

Descriptors: *Sonar signals, Radiation patterns, Modification, Beam forming, *Sonar transducers, Computations, Errors, Bearing(Direction), Phase studies.
Identifiers: MOST project-3, AN/SQS-26.

This technical note is a supplement to a previous TRACOR technical memorandum on redundancy, which contained discussions of the effects of inoperative transducer elements, power amplifiers and preamplifiers on beam patterns and SSI bearing error, as well as an analytical treatment of the effects of noise on SSI bearing errror. Only random inoperative elements and inoperative horizonal layers of elements were considered in that investigation.

N79-28597/9GA PC **A02**/MF **A01**
Laboratorio de Acustica e Sonica, Sao Paulo (Brazil).
Ultrasonic Inspection and Control of Weldments in Pressure Vessels and Thickness Measurement for Corrosion Verification.
L. X. Nepomuceno, M. F. Barbosa, and C. Feth.
12 Oct 76, 11p
In Portuguese; English Summary.

Descriptors: Corrosion, Thickness, Welded joints, *Pressure vessels, *Ultrasonic flaw detection.

For abstract, see STAR 1719

17B. Communication

AD-A070 668/9GA PC **A05**/MF **A01**
Naval Ocean Systems Center San Diego CA
SSIXS Shore System Troubleshooting. Procedures for Restoring Satellite Link Operation at the OPCONCEN of the Submarine Satellite Information Exchange System (SSIXS).
Technical document,
D. P. Hurst. Apr 79, 88p Rept no. NOSC/TD-217

Descriptors: *Data links, *Maintenance, Methodology, Algorithms, Tactical communications, Information exchange, Submarines, Data processing equipment, Modems.
Identifiers: AN/UYK-20, Communication satellites, Radio relay systems, SSIXS systems.

This document contains detailed technical information concerning the operation and maintenance of SSIXS. It contains flowcharts and narratives that provide a logical sequence of procedures for troubleshooting the SSIXS satellite link. (Author)

AD-A070 672/1GA PC **A03**/MF **A01**
MITRE Corp Bedford MA
Analytic and Simulation Results for CSMA Contention Protocols.
Technical rept.,
C. E. Labarre. May 79, 39p MTR-3672, ESD-TR-79-126
Contract F19628-79-C-0001

Descriptors: *Communications networks, *Data transmission systems, *Coaxial cables, *Multiple access, Carrier frequencies, Radio links, Simulation.
Identifiers: Contention protocols, Listen while talk, Listen before talk, Computer networks, Packet radios, Time division multiple access, *Protocols.

The behavior and comparative performance of the Listen-While-Talk (LWT) and Listen-Before-Talk (LBT) CSMA contention protocols are examined using analytic and simulation techniques. The equilibrium throughput and delay equations for the non-persistent LBT and LWT protocols are derived. Simulation results are provided for the 1-persistent LWT and LBT protocols as implemented on the MITRE coaxial cable system. The throughput and delay performance of the LWT protocol is demonstrated to be superior to that of other contention protocols for use in local networks. Dynamic control procedures, similar to those used in other contention systems, are applicable to LWT CSMA protocols. (Author)

AD-A070 703/4GA PC **A15**/MF **A01**
Defense Communications Engineering Center Reston VA
Design Concepts for the Next Generation CONUS AUTOVON.
Technical rept.,
R. F. Deardorff, W. P. Dotson, T. C. Harris, and W. G. Hartung. Dec 78, 342p DCEC-TR-18-78 , AD-E100 231

Descriptors: *Automatic voice network, *Commercial communications, Digital systems, United States, Telecommunication, Cost effectiveness, Sound transmission, Switches, Telephone systems, Telegraph systems, Voice communications, Communications networks, Communication satellites.
Identifiers: Switched circuit automatic networks, Reviews.

This report reviews technological developments in commercial telecommunications in switching, terrestrial transmission and satellite communications. Based on this assessment, six alternatives were postulated and analyzed to gain a better understanding of the fundamental structure, relationships and sensitivities of cost, survivability and performance considerations. The study indicates that there is a potential for large savings by exploiting the technological improvements in commercial communications. Although the uncertainties are very large for the more radical alternatives, the major risks are not technical. No single alternative is the preferred alternative. A composite of the best attributes of each is recommended and an implementation strategy is postulated.

AD-A070 723/2GA PC **A05**/MF **A01**
ITT Electro-Optical Products Div Roanoke VA
Low Cost Fiber Optic Cable Assemblies for Local Distribution Systems.
Final rept. 25 May 77-30 Oct 78,
R. E. Thompson, and J. C. Smith. 20 Nov 78, 86p
Contract DAAB07-77-C-2681

Descriptors: *Fiber optics, *Optical communications, Electric cables, Waveguides, Low loss, Ruggedized equipment, Broadband, Plastics, Silicon dioxide, Cladding, Field equipment, Tactical communications, Electromagnetic interference, Electromagnetic pulses.

This report describes the evaluation and optimization of low cost fiber optic cable using plastic clad silica fibers. As part of the program, silica core with RTV silicone cladding and a protective plastic jacket fibers were used to produce the cables ECOM-1 and ECOM-2. The second phase of the contract consisted of developing an optimized optical fiber cable which would meet more stringent requirements and overcome the deficiencies found in Cables ECOM-1 and ECOM-3 during the evaluation under extreme conditions. The optimized fiber optic cable was of the external strength member design, using 1 mm optical fibers. It met the requirements for optical (average attenuation at .82 micron was less than 10.5 db/km), mechanical and environmental performance.

AD-A070 746/3GA PC **A05**/MF **A01**
ITT Electro-Optical Products Div Roanoke VA
Devices for Fiber Optics Communication.
Final rept. 15 Apr 77-14 May 78,
G. W. Bickel, and Larry E. Foltzer. Dec 78, 99p AFAL-TR-78-199
Contract F33615-77-C-1058

Descriptors: *Fiber optics, Couplers, Data transmission systems, Silicon dioxide, Plastics, Cladding, Fusion(Melting), Splitting, Directional, Cross sections, Fabrication.
Identifiers: *Optical communications.

This report is the final report on a one-year technology development program for fiber optic coupler components. The devices investigated and developed were three port couplers, directionals and 'T' couplers, and reflective and transmissive star couplers with 7, 19 and 32 ports or port pairs respectively. These coupler components were fabricated by direct fusion of plastic clad silica (PCS) fiber cores. Power division or distribution in these couplers is proportional to the ratio of the area of any port to that of the total coupler cross-sectional area, termed area ratio splitting.

AD-A070 885/9GA PC **A03**/MF **A01**
Army Communications-Electroncs Engineering Installation Agency Fort Huachuca AZ
Low Level Conversion and Expansion/Relocation of Associated Equipment at RAF Croughton AUTODIN Switching Center, England.
Test rept.
30 May 79, 38p Rept no. CCC-TED-79-TR-046

Descriptors: *Communication switching centers, *Digital computers, *Telecommunication, Test and evaluation, Information processing, Modification, Quality assurance, Great Britain.

This test report records the results of Quality Assurance (QA) evaluations and tests conducted during the Low Level Conversion and Expansion/Relocation of Associated Equipment at the Croughton AUTODIN Switching Center (ASC). QA inspections and tests were conducted during the period of 26 January through 3 April 1979.

AD-A070 934/5GA PC **A05**/MF **A01**
Operating Systems Inc Woodland CA
FTD User Communications Development.
Final technical rept. 27 Sep 77-30 Sep 78,
J. A. Balter, A. Tomlinson, and R. V. Weeks. May 79, 77p OSI-R79-005, RADC-TR-79-94
Contract F30602-77-C-0220

Descriptors: *Communication and radio systems, User needs, Computer applications, Technical information centers, Communication terminals, Data management, Data bases, Breadboard models, Prototypes, Minicomputers, Programming languages.
Identifiers: PDP-11/70 computers.

This report describes the evolution of the FTD User Communications System concept from an expanded query facility for specific FTD Scientific and Technical Information System (STIS) to a facility running on a minicomputer and supporting a range at computer-based activities, including a generalized data base and file access, text handling and report generation, calculation, simple plots and graphics, and access via direct links to programs and data on large mainframes. The User Communication System (UCS) design is based on a Digital Equipment Corporation PDP-11/70, to which are attached a number of devices, and peripherals. The report describes the development of a 'breadboard' UCS which would initially support two user workstations. Each workstation would provide an intelligent alphanumeric terminal, an interactive graphics display, a function button keyboard for the entry of User Language commands, and a cassette disk for storing personnal work files in progress. A major emphasis in the UC System was the design of a powerful, but simple and easy-to-use language. This language would adjust to the skill level of the user and would provide a unified and integrated means of executing a diversity of functions. In addition, users would be able to utilize the functional building blocks of the language to define their own functions.

AD-A071 043/4GA PC **A05**/MF **A01**
Army Communications Command Fort Huachuca AZ
Standard Engineering Installation Package. Secure Facsimile (AUTOVON) 2-Wire and 4-Wire.
Final rept.
30 Jun 79, 94p Rept no. ACC-SEIP-034

Descriptors: *Facsimile communication, *Secure communications, *Automatic voice network, Telephone equipment, Installation, Systems management, Data links, Modems, Wiring diagrams, Test methods, Instruction manuals.

The Secure Facsimile (AUTOVON), 2-wire and 4-wire, consists of Secure Facsimile Models 412-F or 412G, TSEC/KG-34, Modem FXM-40A series, Data Access Arrangement (2-wire), AUTOVON Control Unit-10 (4-wire), Telephone Set, 502 A/B, WECO 270-B Disconnect Device and transmit control box (4-wire). This Standard Engineering Installation Package (SEIP) assists project officers, logisticians, engineers, and technicians to program, procure, engineer, and install Secure Facsimile (AUTOVON). Document provides a system description with prerequisites that are essential for effective implementation of Secure Facsimile (AUTOVON). Document also provides necessary drawings and detail wiring instructions for a typical layout. SEIP includes bill of materials and operational test procedure. (Author)

AD-A071 158/0GA PC **A03**/MF **A01**
Laser Diode Labs Inc Metuchen NJ
Light Emitting Diodes for Fiber Optic Communications.
Quarterly rept. nos. 6 and 7, 1 Jan-30 Jun 78,
Albert Gennaro. 30 Jun 78, 36p
Contract DAAB07-76-C-8135

Descriptors: *Fiber optics, *Light emitting diodes, *Optical communications, Aluminum gallium arsenide, Heterojunctions, Etching, High velocity, Wafers, Fabrication, Industrial production, Chips(Electronics), Test and evaluation, Life tests, Test equipment.

The design and fabrication of high speed etched-well light emitting diodes for fiber optic communications is discussed with regard to materials synthesis via LPE, wafer fabrication, and device assembly in a manufacturing environment. (Author)

JPRS-73671 PC **A11**/MF **A01**
Joint Publications Research Service, Arlington, VA.
Radio Link Using Ionospheric Scattering of Meter Waves,
N. N. Shumskaya. 13 Jun 79, 245p
Trans. of mono. Radiolinii Ionosfernogo Rasseyaniya Metrovykh Voln, Moscow, 1973 p1-193.

Descriptors: *Ionospheric propagation, *Scatter propagation, Radio links, Very high frequencies, Transmission loss, Signal to noise ratio.

The report contains a discussion on the results of Soviet studies of the propagation conditions and quality of telegraphic radio communications on scattering of meter waves in the lower region of the ionosphere. Generalized results of the studies of the laws of variation of the 'system losses' and noise level caused by radio wave length cosmic radiation are presented; the results of investigating fading and distortion of the signals are discussed; the engineering procedure is proposed for the energy calculation of the radio links using ionospheric scattering; a brief description of the technical equipment is given. The book can be useful to scientific workers and also radio engineers interested in this type of radio communications.

NTIS/PS-79/0867/6GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Portable Radio Equipment (A Bibliography with Abstracts).
Rept. for 1964-Jul 79,
William E. Reed. Sep 79, 157p*
Supersedes NTIS/PS-78/0795, NTIS/PS-77/0714, NTIS/PS-76/0615, and NTIS/PS-75/547.

Descriptors: *Radio equipment, *Bibliographies, Portable equipment, Antennas, Radio transmission, Power supplies, Abstracts.

The bibliography cites research on portable transmitters, receivers, antennas, power sources, and components. Reports on radio transmission from portable radio equipment are included. (This updated bibliography contains 148 abstracts, 8 of which are new entries to the previous edition.)

N79-28210/9GA PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Orbiting Deep Space Relay Station. Volume 3: Implementation Plan.
Final Report.
J. A. Hunter. 15 Jun 79, 28p NASA-CR-156817, JPL-PUB-79-30-V-3
Contract NAS7-100

Descriptors: *Deep space network, *Space stations, *Spacecraft communication, Life cycle costs, Mission planning, Spacecraft configurations.

For abstract, see STAR 1719

N79-28220/8GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
National Aeronautics and Space Administration Plans for Space Communication Technology.
R. E. Alexovich. 1979, 13p NASA-TM-79217, E-107
Conf-Proposed for Presentation at Eascon Session on Communications Satellite Technol., Washington, D. C., 9-11 Oct. 1979; Sponsored by IEEE.

Descriptors: *Project planning, *Space communication, *Technology utilization, Communications technology satellite, Frequencies, Market research.

For abstract, see STAR 1719

N79-28400/6GA PC **A02**/MF **A01**
Fondazione Ugo Bordoni, Rome (Italy).
Partial Response in the FDM-FM Radio Relay Links.
A. Bernardini, D. Dizenobio, and G. F. Meucci.
Aug 78, 5p FUB-20-1978
Conf-Presented at 6th Colloq. On Microwave Commun., Budapest, Aug. 1978.

Descriptors: Fm/pm (Modulation), Frequency response, *Radio relay systems, Signal encoding, Analog to digital converters, Digital systems, Electromagnetic compatibility, Noise spectra.
Identifiers: Pulse communication, Frequency modulation, Telecommunication, *Coding, Partial response coding.

For abstract, see STAR 1719

PB-298 660/2GA Not available NTIS
National Bureau of Standards, Washington, DC.
The Orbiting Standards Platform.
Final rept.,
H. T. Dougherty, A. J. Estin, W. L. Morgan, and J. J. Woodruff. Sep 78, 9p
Pub. in Proceedings of the Antenna Applications Symposium (1978) Held at Urbana-Champaign, IL. on September 20-22, 1978, p1-9, Sep 78.

Descriptors: *Communication satellites, Standards, Radio relay systems, Antennas, Antenna radiation patterns, Gain, Polarization, Measurement, Signal generators, Field strength.
Identifiers: Ground stations.

Startling growth in satellite communication has placed new burdens on measurement of performance of these systems. The Orbiting Standards Platform (OSP) is a combination satellite signal source and field strength meter which will enable one to make highly accurate truly far field measurements of large aperture antenna gain, pattern, sidelobes, and polarization as well as system G/T and EIRP. These measurements may be used to initially characterize earth station equipment and for the subsequent monitoring of its performance. This is a report on a study just completed on the feasibility of the OSP.

17D. Electromagnetic and Acoustic Countermeasures

AD-A071 026/9GA PC **A02**/MF **A01**
Battelle Columbus Labs OH
Moments of the Random Proportion of an Arc Which Is in the Shadows Cast by Randomly Located Disks of Random Size.
Final rept.,
S. Zacks. Mar 79, 17p
Contract DAAG29-76-D-0100
Prepared in cooperation with Case Western Reserve Univ. Cleveland, Ohio.

Descriptors: *Optical counter countermeasures, *Visual surveillance, Masking, Shadows, Trees, Forests, Land combat, Stochastic processes, Tactical analyses, Approximation(Mathematics).

The present paper is devoted to the study of some properties of the distribution of the total portion of an arc length which is under shadow. The total portion of an arc which is under shadow (or under light) is a random variable having a distribution which is determined by the stochastic properties of the shadow casting objects. In the present Technical Report we show how the moments of this distribution can be determined. Explicit formulas are given for the expection and variance of the total portion in the light, or any specified arc on the circumference of the circle. Preliminary results on the actual distribution are available, but will be provided in a different paper. (Author)

17E. Infrared and Ultraviolet Detection

AD-A070 671/3GA PC **A03**/MF **A00**
Massachusetts Inst of Tech Lexington Lincoln Lab
Quasi-Three-Dimensional Display of Infrared Radar Images Using Range/Intensity Color Mapping.
Technical note,
Robert C. Harney, James S. Martin, and Dorothy R. Sullivan. 6 Dec 78, 31p TN-1978-44, ESD-TR-78-362
Contract F19628-78-C-0002
Color microfiche available from NTIS, 5285 Port Royal Road, Springfield, VA 22161, $6.50. All DDC and NTIS reproductions will be in black and white.

Descriptors: *Image processing, *Radar images, *Optical radar, *Display systems, Carbon dioxide lasers, Digital maps, Algorithms, Colors, Heterodyning, Brightness, Image intensification.

By mapping range information into different hues and intensity information into different apparent brightness levels of each hue on a color display, a three-dimensional quality can be imparted to infrared radar images. A computer algorithm for implementing this range/intensity color mapping is described and several infrared radar images demonstrating the technique are presented. Possible improvements to the current algorithm and areas requiring additional study are also discussed. (Author)

AD-A070 898/2GA PC **A08**/MF **A01**
Dynetics Inc Huntsville AL
Design of IRSS Projectors.
Final rept. 30 Jan-30 Nov 78,
30 Nov 78, 166p MIRADCOM-78-0070-022
Contract DAAK40-78-C-0070

Descriptors: *Image projectors, *Intermediate infrared radiation, Near ultraviolet radiation, Test equipment, Homing devices, Infrared homing, Simulators, Configurations, Spatial distribution, Target recognition, Target signatures, Ray tracing, Mirrors, Target discrimination, Background radiation, Radiometers, Transmittance.
Identifiers: Infrared system simulators.

This final report documents the efforts expended in performance of Design of IRSS Projectors. The report is organized into eight sections, of which this Instruction is one, plus supporting appendices. Following is Section 2., Summary, that outlines the salient study results and scope of the effort; Section 3., Technical Background details the basis of operation of the IRRS display system and projector set, Section 4., Requirements, which present the basis on which designs will be evaluated; Section 5., Test and Evaluation, a section which summarizes the findings of diagnostic tests performed on the projector-display system; These portions are followed by Section 6., Analyses, and Section 7., Performance of Selected Concept. These two sections describe analytically the capabilities of the present projector through development of a radiometric model, and demonstrate how performance is increased to meet the requirements by use of new components. Finally, in Section 8., Recommendations, are suggested additional tasks required to fully substantiate the recommended design.

17G. Navigation and Guidance

AD-A070 538/4GA PC **A02**/MF **A01**
Army Communications Research and Development Command Fort Monmouth NJ
Prediction of Transionospheric Signal Time Delays at Widely Separated Locations Using Correlative Techniques.
Research and development technical rept.,
H. Soicher. May 79, 19p Rept no. CORADCOM-79-2

Descriptors: *Ionospheric propagation, *Radio navigation, *Radar navigation, Time intervals, Delay, Error analysis, Linear regression analyses, Correlation techniques, Space navigation, Artificial satellites, Electron density, Diurnal variations.

Excess time delays of transionospheric radio signals introduce ranging errors in satellite-navigation and radar systems, which are directly proportional to the total electron content (TEC) along the propagation path. Correlations of TEC values (based on linear regression analysis) at Fort Monmouth, NJ (40.18 N, 74.06 W) and Richmond, FL (25.60 N, 80.40 W), as well as at Richmond, FL and Anchor-

age, Alaska (61.04 N, 149.75 W) were previously determined. The correlation analysis was performed at monthly and daily intervals for winter periods during the quiet phase of the solar cycle. Average regression lines obtained by the analysis were then used to try to determine TEC at Richmond, assuming the availability of TEC in Fort Monmouth, and at Anchorage, assuming the availability of TEC in Fort Monmouth, and at Anchorage, assuming the availability of TEC at Richmond. In most cases, the predicted TEC was within one standard deviation of actual observed data for the former case, and within two standard deviations for the latter case. (Author)

AD-A070 775/2GA PC **A10**/MF **A01**
Champlain Technology Industries Palo Alto CA
Systems Integration: RNAV and the Upgraded Third Generation System.
Final rept. Jul 75-Dec 76,
E. H. Bolz, R. W. Scott, A. R. Stephensen, and W. Heine. Dec 76, 225p FAA-RD-77-22
Contract DOT-FA72WA-3098

Descriptors: *Air traffic control systems, *Economic analysis, Microwave landing systems, Discrete address beacon systems, Commercial aviation, Cost effectiveness, Aviation safety, Performance(Engineering), Avionics, Air traffic controllers, Work measurement, Forecasting.

This document presents the results of an analysis of the features of the Upgraded Third Generation ATC System in a program of evaluation of the impact of the implementation of Area Navigation on the other features of the UG3RD System. This analysis includes evaluations of the impact of RNAV on the performance and costs of these UG3RD features and, in turn, their impact on the performance, costs and benefits attendant to the implementation of RNAV. As a part of this study of UG3RD System has been examined from the systems integration point of view. One result of the study is the establishment of the effects which RNAV could have on UG3RD feature implementation schedule tradeoffs and interactions. These judgements were based upon a study of the problems of the existing ATC system, and the capabilities of each UG3RD feature, including RNAV, for solving each of these problems. Overall RNAV implementation costs and benefits (airline, general aviation, ATC system and airline passenger) are projected annually to the year 2000. These annual figures have been discounted to present value totals (1976), according to guidelines issued by the Office of Management and Budget, and the resulting benefit/cost ratios of RNAV are presented herein.

AD-A070 782/8GA PC **A06**/MF **A01**
Facility Checking Squadron (1866th) (AFCS) Scott AFB IL
TRACALS Evaluation Report. Special Evaluation Report QOT and E of the AN/GRN-29(V) SSILS, Wright-Patterson AFB, Ohio, 10-19 April 1979.
Final rept.,
Harvey J. Leister. 10 Jun 79, 105p Rept no. 79/66S-166

Descriptors: *Microwave landing systems, *Air Force facilities, Solid state electronics, Airports, Radio transmitters, Microwave antennas, Antenna radiation patterns, Test and evaluation.
Identifiers: *AN/GRN-29(V), Wright-Patterson Air Force Base.

This report presents the results of the 10 - 19 April 1979 TRACALS evaluation of the Wright-Patterson AN/GRN-29(V) SSILS for runway 05. The evaluation was conducted to determine the capabilities and limitations of the system in its installed environment. Results presented in this report can be used as a guide to anticipated performance until there is a significant change in ground equipment, siting environment, screening, or operational use. (Author)

AD-A070 786/9GA PC **A04**/MF **A01**
Federal Aviation Administration Washington DC Office of Aviation Policy
IFR Aircraft Handled: Forecast by Air Route Traffic Control Center, Fiscal Years 1979-1990,
Bernard Hannan. Apr 79, 54p Rept no. FAA-AVP-79-1

Descriptors: *Air traffic, *Instrument flight, Air traffic control systems, Forecasting, Mathematical models.
Identifiers: *Air route traffic control, Instrument flight rules.

The report presents the forecasts of Instrument Flight Rule (IFR) aircraft handled by FAA air route traffic control centers (ARTCC). It serves as a base for the FAA planning and budget process in determining future requirements for facilities, equipment and manpower. The forecasts show that total aircraft handled will increase from 28.1 millions in FY 1978 to 45.6 million in FY 1990. These national total numbers along with those for the intervening years are broken down by FAA region and by each air route traffic control center in this report. (Author)

AD-A070 925/3GA PC **A04**/MF **A01**
Weather Wing (5th) Langley AFB VA
Computing Basic Solar and Lunar Data from the Air Almanac.
Final technical note,
John K. Sanders, and Charles R. Elliott. Jun 79, 70p Rept no. 5WW-TN-79-002

Descriptors: *Almanacs, Time, Programmed instruction, Navigational aids, Sunrise, Sunset, Twilight, Tables(Data), Computations.
Identifiers: Air Almanac, Astronomical data, Moonrise, Moonset.

This technical note provides programmed instruction on use of The Air Almanac to compute times of sunrise, sunset, moonrise, moonset, and duration of civil twilight at any location between latitudes 60 deg S and 90 deg N. Appropriate basic astronomy is included. (Author)

AD-A071 052/5GA PC **A02**/MF **A01**
Maritime Inst of Tech and Graduate Studies Linthicum Heights MD
Pilotage in the Port of New York.
Final rept. Dec 77-Jul 78,
Jack R. Huffner. Jul 78, 13p USCG-D-81-78
Contract DOT-CG-74777-A

Descriptors: *Navigation, *Harbors, New York City(New York), Collision avoidance, Shipping, Harbor radar, Marine terminals, Waterways, Safety, Decision making.
Identifiers: *Harbor pilots, Port of New York.

The report presents the results of a study of pilotage in the Port of New York. A major goal was to identify pilotage information, its source, the way it is used, and how it relates to the pilots' command orders. Seventeen transits in six areas of the harbor were recorded on video tape. In edited form they provide more than 24 hours of detailed descriptions of piloting events. Discussions are presented of the navigation problems in the major harbor areas and the types of information the pilots use for their maneuvering decisions. It was concluded that three interacting sources of information form the basis for the decision process: local knowledge, transit specific information, and knowledge of shiphandling. His local knowledge permits the pilot to maintain orientation, fix position, and anticipate dynamic characteristics of the environment. Transit specific information builds before and during the transit and is a source of information about the dynamics of the environment, the ship, and their interactions. Shiphandling knowledge serves as a background for most order decisions. It was concluded that there are five basic conning positions that have important implications for navigation and bridge design and layout. It was concluded that technical advances in propulsion control are not being fully utilized to meet the navigation requirements in pilotage. (Author)

AD-A071 056/6GA PC **A17**/MF **A01**
National Maritime Research Center-Kings Point NY
Rules of the Road Training Investigation.
Final rept.,
P. Aranow, T. J. Hammell, and M. Pollack. Nov 78, 394p CAORF-103, USCG-D-25-79
Contract MIPR-Z-70099-7-72541

Descriptors: *Navigation, *Regulations, Safety, Shipping, Merchant vessels, Tankers, Human factors engineering, Coast Guard, Training, Collision avoidance.
Identifiers: *International rules of the road, Maritime safety.

This report describes the results of experiments using the Maritime Administration Computer Aided Operations Research Facility (CAORF) ship maneuvering simulator to determine if training in the changes to the steering rules of the Internatinal Rules of the Road (1977) causes a difference in watch officer behavior in the crossing/meeting collision situations. An additional objective was to determine the differences between two ship types (VLCC and containership) in the same situations. A tightly structured, counterbalanced mixed design with one between- and three within-subject variables was applied to eight realistic experimental scenarios. All scenarios involved failure to give way, in five or twenty-five degree crossings, between a 25 knot containership and a 15 knot VLCC. A half-day, classroom training program, using a sound/slide presentation and case study discussions, was effective in increasing knowledge and understanding of the Rules changes. Transfer of training to the simulator did occur with the trained group. Consistency of performance (range to target ship at maneuver) was significantly improved, fewer course changes per maneuver were made, and better advantage was taken of the rule pertaining to ambiguous meeting/crossing situations by the trained group. The closest points of approach (CPA) for the containership sample were significantly larger than for the VLCCs, even though larger course changes were made by the VLCCs at approximately the same range (4 nm).

AD-A071 070/7GA PC **A04**/MF **A01**
Facility Checking Squadron (1866th) (AFCs) Scott AFB IL
TRACALS Evaluation Report, Communications Initial Evaluation Report, Rickenbacker AFB, Ohio, 17-23 April 1979.
Final rept.,
Allen C. Mathews. 15 Jun 79, 73p Rept no. 79/66C-164

Descriptors: *Communication and radio systems, *Air traffic control systems, Ground support equipment, Ultrahigh frequency, Very high frequency.
Identifiers: Rickenbacker Air Force Base.

A Communications Initial Evaluation was performed at Rickenbacker AFB, Ohio from 17-23 April 1979. The purpose of the evaluation was to define the capabilities and limitations of the air traffic control communications systems. Included in this report are the results and analysis of ground equipment and system measurements, and correlation of predicted and measured receive signal levels as they affect horizonal and vertical coverage. This report can be used as a guide for anticipated performance of the ATC communications at Rickenbacker AFB until there is a deletion, addition, relocation, or change in the horizon profile. (Author)

AD-A071 075/6GA PC **A07**/MF **A01**
Naval Postgraduate School Monterey CA
A Developmental Computer Model for Investigations of Air Traffic Management Problems: A Case Investigating Two Decision Strategies.
Master's thesis,
John Thomas Malokas, Jr., and Arvid Paul Pederson. Mar 79, 133p

Descriptors: Digital simulation, Models, Air traffic control systems, *Scheduling, Aviation safety, Air traffic, Limitations, Input output processing, Decision making, Theses.
Identifiers: *Computerized simulation, SIMSCRIPT programming language.

A computer simulation model designed to help solve regional air traffic scheduling problems was developed. Bases, mission areas, and aircraft were modeled using the simulation language SIMSCRIPT. Events in the simulation included takeoffs, departures, enroutes, missions, arrivals at Initial Approach Fixes (IAFs) and landings. To demonstrate potential use of the model, the problem of rescheduling Strategic Air Command (SAC) aircraft upon base closures was addressed. Two strategies for the diversion of such aircraft were developed, implemented and the results compared on the basis of impact on final destination bases and average aircraft airborne time. Strategy 1 entailed the rerouting of aircraft to designated al-

ternate bases or to the nearest open base without constraint. Strategy 2 involved the selection of an alternate base by insuring that parking spaces and appropriate maintenance support were available. Finally, extensions to the model and recommendations are discussed. (Author

AD-A071 104/4GA PC **A03**/MF **A01**
Army Research Inst for the Behavioral and Social Sciences Alexandria VA
Effects of Illumination Level and Sense of Direction on Land Navigation Performance.
Technical paper,
Joseph I. Peters, Paul R. Bleda, and Michael L. Fineberg. May 79, 43p Rept no. ARI-TP-362

Descriptors: *Surface navigation, Illumination, Infantry, Night, Low light levels, Aptitudes, Position finding, Direction finding, Orientation(Direction), Psychological tests, Ratings, Army personnel.

This research quantitatively assessed the ability of infantrymen to perform a navigation task in conditions of limited visibility without the aid of night vision devices. Simulation of night was also tested by having the soldiers wear light-attenuating devices, and individual differences between good and poor navigators were studied with regard to the soldier's personal history, attitudes, and performance on cognitive tests aimed at discriminating sense of direction. The experiment required 30 soldiers to perform a dead-reckoning task to four checkpoints over a 2,330 m course in mountainous desert. Ten soldiers navigated during the day, 10 navigated at night, and the remaining 10 navigated in the day but wore light-attenuating devices to simulate night. half the soldiers in each group had a poor sense of direction, according to their own self-ratings, and the other half a good sense of direction.

N79-28164/8GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
The REFSAT Approach to Low-Cost GPS Terminals.
J. W. Sennott, A. K. Choudhury, and R. E. Taylor. Apr 79, 37p NASA-TM-79655
Subm-Submitted for Publication.

Descriptors: *Global positioning system, *Navigation aids, *Synchronous satellites, Cross correlation, Low cost, Navstar satellites, Signal processing, Spread spectrum transmission, Tracking stations.
Identifiers: Receivers, L band.

For abstract, see STAR 1719

17H. Optical Detection

AD-A070 975/8GA MF **A01**
Naval Weapons Center China Lake CA
Environmental Test Report on the Target Detector DSU-15/B.
Technical memo.,
L. J. Huber. Jun 75, 60p NWC-TM-2523, GIDEP-E115-2123
Supplements Rept. no. GIDEP-E093 1630. Supersedes Rept. no. GIDEP-E096-2283.
Availability: Microfiche copies only.

Descriptors: *Target detection, *Optical detectors, *Environmental tests, Drop tests, Vibration, Transportation, Storage, Temperature, Acoustics, Military requirements.

No abstract available.

17I. Radar Detection

AD-A070 793/5GA PC **A04**/MF **A01**
Ohio State Univ Columbus Electroscience Lab
Radar Target Identification.
Final technical rept. 1 Mar 77-30 Sep 78,
D. M. Moffatt, K. A. Shubert, and E. M. Kennaugh. May 79, 70p ESL-784677-2, RADC-TR-79-118
Contract F19628-77-C-0125

Descriptors: *Radar targets, *Target discrimination, Radar signals, Sweepfrequency radar, Aerial targets, Jet fighters, Identification, Signal processing, Time domain, Resonance, Difference equations, Coefficients, Backscattering, Numerical analysis, Radar pulses, Waveforms, Target recognition, Data bases.

This report presents a review of the radar target identification problem with primary emphasis on practical solutions as opposed to abstract inverse scattering formalisms. A time domain viewpoint is stressed throughout because of its compactness, ease of visualization and diagnostic potential and because it is a unifying tool for various electromagnetic approximations. A small finite set of excitation invariant target descriptors, the coefficients of a linear, homogeneous difference equation, or equivalently the complex natural resonances, are justified as a discrimination tool. A prediction-correlation method for using these coefficients in identification is demonstrated. It is shown that substructure features of the targets, in this case vertical and horizontal stabilizers of aircraft, possibly can be used as a discrimination feature and that the required interrogating radar signal spectrum for this case is significantly higher than that required for previous discrimination schemes using excitation invariant parameters. In this specific case, however, the target parameters do not have a simple physical interpretation. (Author)

AD-A071 008/7GA PC **A03**/MF **A01**
Massachusetts Inst of Tech Lexington Lincoln Lab
Bistatic Scattering Reflection Asymmetry and Polarization Reversal Symmetry.
Technical note,
Gregory E. Heath. 17 Apr 79, 42p TN-1979-4, ESD-TR-79-44
Contract F19628-78-C-0002

Descriptors: *Bistatic radar, *Electromagnetic scattering, Polarization, Radar targets, Symmetry, Potential theory, Vector spaces.

Circularly polarized bistatic scattering from plane-symmetric targets with otherwise arbitrary electrical properties exhibits reflection asymmetries and polarization reversal symmetries which are useful for bistatic radar data interpretation. In addition, the symmetries can be used to reduce the time and expense in obtaining bistatic scattering data from static range measurements and theoretical or computer calculations. The reflection asymmetry and polarization reversal symmetry relations are derived in this note. The symmetry relations are then combined with the principle of electromagnetic reciprocity to determine the minimum number of measurements needed to completely characterize target scattering. (Author)

AD-A071 014/5GA PC **A03**/MF **A01**
Massachusetts Inst of Tech Lexington Lincoln Lab
Correlation Techniques for Deep Space 'Uncorrelated Targets'.
Technical note,
Ramaswamy Sridharan, William P. Seniw, and Aubyn Freed. 13 Mar 79, 31p TN-1979-24, ESD-TR-79-37
Contract F19628-78-C-0002

Descriptors: *Satellite tracking systems, *Radar tracking, Correlation techniques, Target classification, Optical tracking, Orbits, Deep space, Target signatures, Motion.
Identifiers: Millstone Hill radar.

The surveillance fences of SPACETRACK detect and track a large number of space objects that do not correlate with known objects in the satellite catalog. This note describes the techniques developed at the Millstone Hill Radar for the analysis of these uncorrelated targets. (Author)

AD-A071 110/1GA PC **A06**/MF **A01**
Battelle Columbus Labs OH
Standard Electronic Module Radar Life Cycle Cost Comparison.
Final rept. 1 Jun 78-15 Jan 79,
Thomas R. Cork. Apr 79, 125p AFAL-TR-79-1025
Contract F33615-78-C-1508

Descriptors: *Modules(Electronics), *Life cycle costs, Cost analysis, Meteorological radar, Avionics, Standardization, Joint military activities, Solid state electronics, Cost estimates.
Identifiers: AN/APQ-122.

The report presents a life cycle cost (LCC) analysis of an airborne weather radar system functionally similar to the Standard Electronic Module Radar (SEMR) and compares the LCC estimates for this system to previously developed LCC estimates for the SEMR. The SEMR has been designed, fabricated and tested as a demonstration of the concepts of the TRI-service Standard Electronic Module program. A previous study analyzed the LCC characteristics of the SEMR and developed LCC estimates for specific implementation alternatives. The APQ-122V(5) radar design was selected for LCC comparison as a representative example of solid state systems composed of custom subassemblies. The LCC analysis of a SEMR-equivalent of APQ-122 system was conducted using procedures and assumptions which were consistent with those used in the previous SEMR LCC study. Results presented in this report include a comparison of baseline LCC totals and subtotals, a comparison of the sensitivity of the two sets of LCC estimates to operational parameters, and an analysis of how the critical assumptions used in developing the SEMR equivalent APQ-122 LCC estimates affect the baseline comparison. The primary finding was that, when using available data and consistent analytical procedures, the baseline LCC estimates for the SEMR-equivalent APQ-122 system were approximately 40% lower than the SEMR estimates. Sensitivity analyses did not significantly alter this finding.

AD-A071 193/7GA PC **A11**/MF **A01**
Environmental Research Inst of Michigan Ann Arbor
Measurements of Bistatic Clutter Cross Section.
Final technical rept. 21 Sep 77-30 Jun 78,
R. W. Larson, F. Smith, A. Fromm, A. Maffett, and R. C. Heimiller. May 79, 229p ERIM-130300-15-F, RADC-TR-79-15
Contract F30602-77-C-0145
See also Rept. no. RADC-TR-77-389, AD-A049 037.

Descriptors: *Bistatic radar, *Radar clutter, *Radar cross sections, Ground clutter, Terrain analysis radar, Vegetation, Snow, Angles, Grazing, Polarization, Orientation(Direction).

The work reported utilized the air-ground bistatic instrumentation developed previously under Contract F30602-76-C-0037. Empirical data have been obtained from which estimates of the bistatic reflection coefficient have been determined. Measurements were made over snow covered terrain and over an orchard with snow cover. The snow covered terrain area was the same area of tall weeds and rough ground utilized during the 1976 measurements. Data were obtained at incident and reflective angles of 80, 70 and 60 deg (low grazing angles) and 0-180 deg azimuth angle. Measurements were made at 3 cm and 23 cm wavelength with horizontal polarization. Both like and orthogonal polarizations were received at each wavelength; four channels of data were recorded. The measurements technique utilized an aircraft with 3 cm and 23 cm pulsed transmitters and four channel receivers on a ground based tower. Coherent signals were recorded by utilizing a separate air ground link for the receiver local oscillator signal. Approximately 146 data curves are given.

PAT-APPL-6-053 572/GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Pasadena Office, CA.
Echo Tracker/Range Finder for Radars and Sonars.
Patent Application,
N. J. Constantinides. Filed 29 Jun 79, 22p N79-26253/1, NASA-CASE-NPO-14361-1
Contract NAS7-100
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: *Altimeters, *Echoes, Pulse radar, *Radar tracking, *Range finders, *Sonar, Airborne/spaceborne computers, *Patent applications, Pulsed radiation, Synthetic aperture radar.

An echo tracker/range finder or altimeter is described in which the pulse repetition frequency (PFR) of a predetermined number of transmitted pulses is adjusted so that echo pulses received from a reflecting object are positioned between transmitted pulses and divide their interpulse time interval into two time intervals having a predeter-

Group 17I—Radar Detection

mined ratio with respect to each other. The thus-adjusted PRF is related to the range of the reflecting object. In addition, the invention provides a means whereby the arrival time of a plurality of echo pulses is defined as the time at which a composite echo pulse formed of a sum of the individual echo pulses has the highest amplitude. An especially useful application is in determining altitude information for an aircraft or an orbiting spacecraft utilizing a synthetic aperture imaging radar system. However, it could be used with sonar systems, laser ranger finders, or any other kind of rangefinding application in which a number of pulses are received.

SAND-78-7069 PC **A07**/MF **A01**
Sandia Labs., Albuquerque, NM.
Backscatter Response of Roads and Roadside Surfaces.
W. H. Stiles, F. T. Ulaby, and E. Wilson. Jan 79, 142p
Contract EY-76-C-04-0789

Descriptors: *Asphalts, *Concretes, *Grass, *Radar, Albedo, Angular distribution, *Backscattering, Ghz range 01-100, Performance, Polarization, Wave propagation.
Identifiers: ERDA/657007.

For abstract, see ERA citation 04:045691.

17J. Seismic Detection

AD-A071 112/7GA PC **A03**/MF **A01**
Systems Science and Software La Jolla CA
Analysis of P-Wave Residuals and Summary of Current Research.
Quarterly rept. 1 Oct - 31 Dec 77,
J. F. Masso, J. M. Savino, and Thomas C. Bache. Jan 78, 40p Rept no. SSS-R-78-3559
Contract F08606-76-C-0041, ARPA Order-2551
Report on Station Transfer Functions.

Descriptors: Seismic waves, Nuclear explosions, *Underground explosions, Pressure gradients, Transfer functions, Heat flux, Seismic signatures.
Identifiers: Primary waves, Surface waves, Body waves, Heat transfer, Sources, *Seismic detection, *Seismological stations, USSR, Siberia, Correlation.

Brief summaries of work currently underway or completed during the period from 1 October 1977 to 31 December 1977 are given in four topic areas: Source Studies, Data Analysis, Surface Wave Studies and Body Wave Studies. Also included in the report is a detailed description of a research project not previously reported. This study is entitled, Worldwide Observations of P-Wave Travel-Time Residuals. A large set of residuals compiled from ISC bulletins by Georges Poupinet of Institute de physique du Globe were compared with other data for the United States. The conclusions are that; large negative residuals correlate with low heat flow and positive magnitude bias, and large positive residuals correlate with high heat flow and negative magnitude bias. The same correlation between heat flow and travel-time residuals holds for stations located on the Russian and Siberian Platforms in the U.S.S.R. (Author)

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

AD-A070 889/1GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
Optimization of Stabilized Imploding Liner Fusion Reactors.
Interim rept.,
P. J. Turchi, D. L. Book, and R. L. Burton. 25 Jun 79, 14p Rept no. NRL-MR-4029
Presented at the Symposium on Fusion Technology (10th) Held at Padova, Italy, 4-8 Sep 78.

Descriptors: Plasmas(Physics), Confinement(General), Implosions, Nuclear fusion, Magnetic fields, Cavity liners, Adiabatic conditions, Compression, Plasma control.
Identifiers: Rayleigh-Taylor instability, *LINUS reactors, Thermonuclear devices, Optimization.

In the NRL LINUS concept for controlled fusion systems, a rotating liquid metal cylinder or liner is imploded onto a trapped plasma/magnetic field payload to obtain fusion temperatures and near-megagauss magnetic field levels by adiabatic compression. The combined use of linear rotation and a free-piston driving technique eliminates Rayleigh-Taylor instabilities and permits safe, repetitive implosion-reexpansion cycles. Optimization of system size is accomplished in terms of the implosion radius-ratio and liner compressibility. Trade-offs between reactor size and initial plasma temperature are indicated. (Author)

AD-A070 890/9GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
Generation of a Rotating Liquid Liner by Tangential Injection.
Interim rept.,
R. L. Burton, P. J. Turchi, D. J. Jenkins, R. E. Lanham, and J. Cameron. 25 Jun 79, 18p Rept no. NRL-MR-4025

Descriptors: Plasmas(Physics), Confinement(General), Cavity liners, Implosions, High density, Compression, Nuclear fusion, Plasma control, Viscosity, Shear properties, Vortices, Turbulence.
Identifiers: *LINUS reactors, Thermonuclear devices.

Efficient compression of low mass-density payloads by the implosion of higher mass-density liquid cylinders or liners, as in the NRL LINUS concept for controlled thermonuclear fusion, requires rotation of the liner material to avoid Rayleigh-Taylor instabilities at the liner-payload interface. Experimentally, such implosions have been demonstrated with liners formed within rotating implosion chambers. The present work uses a scale-model experimental apparatus to investigate the possibility of creating liner rotation by tangential injection of the liquid liner material. Different modes of behavior are obtained depending on the fluid exhaust procedures. Right-circular, cylindrical free surfaces are achieved with axial exhaust of fluid at radii interior to the injection nozzles, for which the liner exhibits a combination of solid-body and free vortex flows in different regions. Measurements allow estimates of power losses to viscous shear, turbulence, etc. A simple model based on open-channel flow is then derived, which is in good agreement with experiment, and is used to extrapolate results to the scale of a possible LINUS fusion reactor. (Author)

ANL-78-109 PC **A03**/MF **A01**
Argonne National Lab., IL.
Current Status of Fusion Reactor Blanket Thermodynamics.
E. Veleckis, R. M. Yonco, and V. A. Maroni. Apr 79, 34p
Contract W-31-109-ENG-38

Descriptors: *Breeding blankets, Ceramics, Lithium, Lithium alloys, Lithium carbides, Lithium deuterides, Lithium hydrides, Lithium nitrides, Lithium oxides, Lithium tritides, Materials testing, Sorption, Thermodynamic properties.
Identifiers: ERDA/700201, ERDA/700209, ERDA/360103, *Thermonuclear reactor materials.

For abstract, see ERA citation 04:045738.

CONF-790327-100 PC **A02**/MF **A01**
Argonne National Lab., IL.
Telecoping Beams for Heavy Ion Fusion.
R. J. Burke. 1979, 5p
Contract W-31-109-ENG-38
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Inertial confinement, Beam transport, Focusing, *Ion beams, Linear momentum, Velocity.
Identifiers: ERDA/700208, Heavy ions.

For abstract, see ERA citation 04:042112.

CONF-790327-106 PC **A02**/MF **A01**
Argonne National Lab., IL.
12.5 MHz Heavy Ion Linac for Ion Beam Fusion.
A. Moretti, J. M. Watson, J. S. Moenich, M. H. Foss, and T. K. Khoe. 1979, 5p
Contract W-31-109-ENG-38
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Linear accelerators, Construction, Design, Inertial confinement, Ion beams, Performance.
Identifiers: ERDA/700208, ERDA/430100, *Heavy ion accelerators, *I-beam type reactors, Xenon ions.

For abstract, see ERA citation 04:042114.

COO-2456-T1 PC **A02**/MF **A01**
Columbia Univ., New York. Plasma Physics Lab.
High-beta Tokamak Research: Torus I and Torus II. Quarterly Status Report, 1 April–30 June 1978.
J. Marsen, G. Georgiou, and S. Paul. 6 Jul 78, 4p
Contract EY-76-S-02-2456

Descriptors: *Tokamak devices, High-beta plasma, Limiters, Plasma diagnostics, Pyrex, Research programs, Reviews.
Identifiers: ERDA/700200, Torus-I tokamak, Torus-II tokamak.

For abstract, see ERA citation 04:042089.

COO-4184-6(V.1) PC **A03**/MF **A01**
McDonnell Douglas Astronautics Co., St. Louis, MO.
Developing Maintainability for Tokamak Fusion Power Systems. Phase II Report. Volume I: Executive Summary.
G. M. Fuller, H. S. Zahn, H. C. Mantz, G. R. Kaletta, and L. M. Waganer. Nov 78, 49p
Contract EG-77-C-02-4184

Descriptors: Breeding blankets, First wall, *Tokamak type reactors, Electric power, Electricity, Maintenance, Power demand, Reactor maintenance.
Identifiers: ERDA/700209.

For abstract, see ERA citation 04:045757.

COO-4184-6(V.3) PC **A06**/MF **A01**
McDonnell Douglas Astronautics Co., St. Louis, MO.
Developing Maintainability for Tokamak Fusion Power Systems. Phase II Report. Volume III: Appendices.
G. M. Fuller, H. S. Zahn, H. C. Mantz, G. R. Kaletta, and L. M. Waganer. Nov 78, 114p
Contract EG-77-C-02-4184

Descriptors: *Tokamak type reactors, UWMAK reactors, Breeding blankets, Failures, First wall, Reactor maintenance, Remote handling equipment.
Identifiers: ERDA/700209.

For abstract, see ERA citation 04:045759.

DOE/ET-0096 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Office of Fusion Energy.
Final Report of the Ad Hoc Committee on TFTR Physics.
J. F. Clarke. May 79, 36p

Descriptors: *TFTR reactors, *Tokamak type reactors, Document types, Reviews.
Identifiers: ERDA/700105.

For abstract, see ERA citation 04:045708.

DOE/ET-0099 PC **A06**/MF **A01**
Department of Energy, Washington, DC. Office of Fusion Energy.
Magnetic Fusion Theory Effort.
May 79, 104p

Descriptors: Plasma, Research programs, Reviews.
Identifiers: ERDA/700105, *Thermonuclear devices.

For abstract, see ERA citation 04:045709.

LBL-8643 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Development of Large Rectangular Ceramic Insulators for Ion Accelerators for the Neutral-Beam Program.
J. A. Paterson, G. W. Koehler, and T. J. Duffy. Mar 79, 6p CONF-790125-48

Contract W-7405-ENG-48
Topical meeting on fusion reactor materials, Miami Beach, FL, USA, 29 Jan 1979.

Descriptors: *Aluminium oxides, *Electrical insulators, *Heavy ion accelerators, *Titanium, Brazing, Ceramics, Glass, Isolated values, Materials testing, Neutral atom beam injection, Numerical data, Thermal expansion.
Identifiers: ERDA/700209, ERDA/700208.

For abstract, see ERA citation 04:044166.

PATENT-4 125 431
Not available NTIS
Department of Energy, Washington, DC.
Tandem Mirror Plasma Confinement Apparatus.
Patent,
T. K. Fowler. Filed 16 Jun 77, patented 14 Nov 78, 16p PAT-APPL-807 081
Supersedes PAT-APPL-807 081-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Tmx devices, Electrostatics, *Plasma confinement, Specifications.
Identifiers: ERDA/700200, *Patents.

For abstract, see ERA citation 04:044121.

PATENT-4 127 442
Not available NTIS
Department of Energy, Washington, DC.
Charge Exchange Cooling in the Tandem Mirror Plasma Confinement Apparatus.
Patent,
B. G. Logan. Filed 16 Jun 77, patented 28 Nov 78, 10p PAT-APPL-807 082
Supersedes PAT-APPL-807 082-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Tmx devices, Charge exchange, Energy losses, Hot plasma, Neutral atom beam injection, Plasma confinement.
Identifiers: ERDA/700101, *Patents, *Cooling systems.

For abstract, see ERA citation 04:044071.

SAND-78-2128C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Hydrogen Retention and Release in First-Wall Coatings for Tokamaks.
B. L. Doyle, and F. L. Vook. 1979, 11p CONF-790442-11
Contract AC04-76DP00789
International conference on metallurgical coatings, San Diego, CA, USA, 23 Apr 1979.

Descriptors: *Boron carbides, *First wall, *Titanium borides, Coatings, Control, Graphite, Hydrogen, Limiters, Permeability, Tokamak devices, Tritium.
Identifiers: ERDA/700201, Absorption, Thermonuclear reactor materials, Performance evaluation.

For abstract, see ERA citation 04:044124.

UCRL-81725 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Intensified CCD for Ultrafast Diagnostics.
J. Cheng, G. Tripp, and L. Coleman. 27 Sep 78, 13p CONF-7810172-1
Contract W-7405-ENG-48
1978 international conference on the application of charge coupled devices, San Diego, CA, USA, 25 Oct 1978, Portions of document are illegible.

Descriptors: Cathode ray tubes, Laser-produced plasma, *Plasma diagnostics, Streak photography, Data processing, Electronic equipment, Equipment interfaces, Image intensifiers, Laser fusion reactors.
Identifiers: ERDA/700102, *Charge coupled devices.

For abstract, see ERA citation 04:044072.

UCRL-82026 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Fusion Target Design.
R. O. Bangerter. 5 Dec 78, 49p CONF-7806114-2
Contract W-7405-ENG-48
Faculty Institute, Inertial Confinement Fusion, Argonne, IL, USA, 5 Jun 1978.

Descriptors: *Laser targets, Computer calculations, Design, Microspheres, Reviews, Simulation.
Identifiers: ERDA/700208, *Intertial confinement.

For abstract, see ERA citation 04:044146.

UCRL-82120 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Lawrence Livermore Laboratory Heavy Ion Fusion Program.
R. O. Bangerter, E. P. Lee, M. J. Monsler, and S. S. Yu. 29 Dec 78, 5p
Contract W-7405-ENG-48

Descriptors: *I-beam type reactors, *Ion beam targets, Accelerators, Design, Direct energy conversion, Interactions, Research programs.
Identifiers: ERDA/700208, Heavy ions.

For abstract, see ERA citation 04:040016.

18B. Isotopes

N79-28506/0GA PC **A25**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Aerodynamic Separation of Gases and Isotopes: Recent Advances.
1978, 592p VKI-LECTURE-Ser-1978-8
Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 29 May - 2 Jun. 1978.

Descriptors: Centrifuges, Conferences, *Gaseous diffusion, *Isotope separation, Jet flow, Energy policy, Hilsch tubes, Laser applications, Membranes, Nozzle flow, Nuclear warfare, Uranium fluorides, Uranium isotopes.
Identifiers: *Meetings.

For abstract, see STAR 1719

18C. Nuclear Explosions

AD-A070 933/7GA PC **A21**/MF **A01**
Adjutant General Center Washington DC
Trip Report of Field Search for Exercise Desert Rock Documentation Conducted by Representatives of The Adjutant General 18 June 1978 to 14 July 1978,
John Henry Hatcher. 4 Aug 78, 490p

Descriptors: *Nuclear explosion testing, *Records, *Army personnel, Nevada, Surface burst, Airburst, Civilian personnel, Observers, Data management, Reports, Files(Records), Information centers, Archives, Nuclear radiation, Exposure(Physiology), Dosimetry.
Identifiers: *Desert Rock exercises, Contractor personnel, Buster-Jangle Operation, Tumbler-Snapper Operation, Upshot-Knothole operation, Teapot Operation, Plumbob operation, Hardtack operation.

This is an after action report of the field search which was undertaken for documentation dealing with Exercises Desert Rock, 1950-58. This search was undertaken when normal holdings of the National Archives, Federal Records Center System, and US Army retired records holding areas and other depositories failed to produce documentation required to meet Dept. of the Army's tasking for the Dept. of Defense Nuclear Test personnel Review Project (NTPR). The specific data sought consisted of identification of the US Army personnel -- military, contractor, civilian, guests and official observers -- who participated in the Desert Rock Exercises. Also sought was any possible evidence of radiation exposure and dosimetry history. The report's nine parts include a summary statement followed by individual annexes for each geographical target of the fields search. Where appropriate supporting documentation has been appended to the summary statement and the individual annexes. In one instance the report ranges beyond the narrow confines of the primary target of the field search. It expands upon the personnel aspects of record keeping and considers the VIP Personnel Files maintained by the National Personnel Records Center, St. Louis. Rationales are presented for a formal appraisal of these files with a view toward establishment of a government-wide standard for maintenance and preservation. The author concludes that the search was generally successful in locating the still exist and documentation, files and records.

LA-tr-79-7 PC **A02**/MF **A01**
Study of the Spectra of the Initial Seismic Signal after a Subterranean Nuclear Explosion. Determination of the Attenuation Coefficient in the Granite.
F. Duclaux. 1971, 19p
Contract W-7405-ENG-36
A, Pure Appl. Geophys. 85 n11 P75-89 1971.

Descriptors: *Nuclear explosion detection, Attenuation, Granites, Seismic detection, *Underground explosions.
Identifiers: ERDA/450300, Translations, France.

For abstract, see ERA citation 04:041577.

SAND-79-0739 PC **A04**/MF **A01**
Sandia Labs., Albuquerque, NM.
Test Plan: Bell Canyon Test WIPP Experimental Program. Borehole Plugging.
C. L. Christensen. Jun 79, 74p
Contract EY-76-C-04-0789

Descriptors: *Boreholes, Containment, Emplacement, Nuclear explosions, Plugging, Sulfur fluorides, Underground explosions.
Identifiers: ERDA/450200.

For abstract, see ERA citation 04:045313.

18D. Nuclear Instrumentation

AD-A071 172/1GA PC **A04**/MF **A01**
National Measurement Lab Washington DC
Standard Procedure for Use of Thermoluminescence Dosimetry in Radiation-Hardness Testing of Electronic Devices.
Interim rept.,
J. C. Humphreys, and S. E. Chappell. Mar 79, 74p Rept no. NBSIR-79-1723

Descriptors: *Luminescent dosimeters, *Thermoluminescence, Radiation effects, Radiation hardening, Electronic equipment, Test methods, Standards, Electron irradiation, Photon bombardment, Radiation absorption.

A standard recommended practice for the use of thermoluminescence dosimetry (TLD) systems has been developed. It is intended for the use of facilities that are engaged in the radiation-hardness testing of electronic components and systems. The practice has been written in the form of an ASTM standard for determination of absorbed dose in a medium as a result of photon or electron irradiation. It covers various aspects of TLD systems such as performance testing, dose calibration, and use procedures and precautions. A selected bibliography of TLD characteristics is included. (Author)

AECL-6347 PC **A02**/MF **A01**
Atomic Energy of Canada Ltd., Chalk River (Ontario). Chalk River Nuclear Labs.
Application of Safeguards Design Principles to the Spent Fuel Bundle Counter for 600 MW CANDU Reactors.
A. J. Stirling, and V. H. Allen. Oct 78, 16p CONF-781007-19, IAEA-SM-231/38
IAEA symposium on nuclear material safeguards, Vienna, Austria, 2 Oct 1978.
U.S. Sales Only.

Descriptors: Candu type reactors, Safeguards, *Spent fuel elements, Counting techniques, Fuel assemblies, Geiger-Mueller counters.
Identifiers: ERDA/055001, Canada, *Nuclear materials management.

For abstract, see ERA citation 04:042442.

CONF-781033-17 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
High Rate NaI Detector System.
L. O. Johnson. 1978, 11p

Contract EY-76-C-07-1570
IEEE nuclear science symposium, Washington, DC, USA, 18 Oct 1978.

Descriptors: *Nai detectors, Densitometers, Design, Electronic circuits, Performance.
Identifiers: ERDA/440101.

For abstract, see ERA citation 04:027631.

COO-2114-30 PC **A02**/MF **A01**
Colorado Univ., Boulder.
Cell Structure for the MAC Central Drift Chamber.
W. T. Ford. 17 May 78, 8p
Contract EY-76-C-02-2114
Portions of document are illegible.

Descriptors: *Drift chambers, Computer calculations, Configuration, Design, Optimization.
Identifiers: ERDA/440104.

For abstract, see ERA citation 04:043692.

LA-UR-78-2562 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
High Resolution Fast Neutron Spectrometry Without Time-of-Flight.
A. E. Evans, and J. D. Brandenberger. 1978, 4p CONF-781113-4
Contract W-7405-ENG-36
Conference on application of small accelerators, Denton, TX, USA, 6 Nov 1978.

Descriptors: *He-3 counters, Long counters, *Neutron spectrometers, Electronic circuits, Fast neutrons, Performance, Specifications.
Identifiers: ERDA/440103.

For abstract, see ERA citation 04:027655.

LA-UR-79-1020 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Quick and Accurate Profile Monitor for Irradiated Fuel.
D. M. Lee, J. R. Phillips, S. T. Hsue, K. Kaieda, and J. K. Halbig. 1979, 8p CONF-790430-6
Contract W-7405-ENG-36
Annual symposium on safeguards and nuclear material management, Brussels, Belgium, 25 Apr 1979, Portions of this document are illegible.

Descriptors: *Spent fuel elements, Bwr type reactors, Fuel pins, Gamma fuel scanning, Ionization chambers, Proportional counters, Pwr type reactors.
Identifiers: ERDA/050800, ERDA/400103, *Radiation monitors, Radiation monitoring.

For abstract, see ERA citation 04:040368.

LBL-8136 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Multichannel Analog to Digital Converter and Readout System for the Time Projection Chamber.
M. R. Maier, S. R. Olson, M. Nakamura, and F. S. Goulding. Oct 78, 9p CONF-781033-43
Contract W-7405-ENG-48
IEEE nuclear science symposium, Washington, DC, USA, 18 Oct 1978.

Descriptors: *Analog-to-digital converters, *Drift chambers, Design, Display devices.
Identifiers: ERDA/440104.

For abstract, see ERA citation 04:043693.

LBL-8140 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Deep Level Transient Spectroscopy of High-Purity Germanium Diodes/Detectors.
E. E. Haller, P. P. Li, G. S. Hubbard, and W. L. Hansen. Oct 78, 8p CONF-781033-26
Contract W-7405-ENG-48
IEEE nuclear science symposium, Washington, DC, USA, 18 Oct 1978.

Descriptors: *High-purity ge detectors, *Spectroscopy, Impurities, Performance testing.
Identifiers: ERDA/440101.

For abstract, see ERA citation 04:031323.

PATENT-4 100 414
Not available NTIS
Department of Energy, Washington, DC.
Method for Measuring Dose-Equivalent in a Neutron Flux with an Unknown Energy Spectra and Means for Carrying out That Method.
Patent,
C. H. Distenfeld. Filed 19 Jan 77, patented 11 Jul 78, 8p PAT-APPL-760 796
Supersedes PAT-APPL-760 796-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Dosemeters, Calibration, *Neutron dosimetry, Personnel dosimetry.
Identifiers: ERDA/440102, *Patents.

For abstract, see ERA citation 04:043690.

PNL-2807 PC **A08**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Seventh DOE Workshop on Personnel Neutron Dosimetry.
1978, 158p CONF-7810131-
Contract EY-76-C-06-1830
DOE workshop on personnel neutron dosimetry, London, UK, 23 Oct 1978.

Descriptors: *Neutron dosimetry, *Personnel dosimetry, Leading abstract, Meetings.
Identifiers: ERDA/440102.

For abstract, see ERA citation 04:045264.

SAND-79-8218 PC **A02**/MF **A01**
Sandia Labs., Livermore, CA.
Tritium-Caused Background Currents in Electron Multipliers.
M. E. Malinowski. May 79, 23p
Contract EY-76-C-04-0789

Descriptors: *Electron multipliers, Background noise, Leakage current, Tritium.
Identifiers: ERDA/440100.

For abstract, see ERA citation 04:045259.

18E. Nuclear Power Plants

AD-A071 095/4GA PC **A03**/MF **A01**
Army Engineer Waterways Experiment Station Vicksburg MS
Proposed Guidelines for Laboratory Testing of Geological Materials for Nuclear Power Facilities.
Final rept. Apr 75-Jun 76,
Arley G. Franklin, and William F. Marcuson, III.
Apr 79, 41p Rept no. WES-MP-GL-79-9
Contract AT(49-24)-0126

Descriptors: Engineering geology, *Test and evaluation, Test equipment, Test methods, Rock mechanics, Soil mechanics, Dynamic tests, Cyclic tests, Soil tests, Laboratory tests, Dynamic response, *Nuclear power plants, *Earthquake engineering.

This report gives proposed guidelines for the laboratory testing of soil and rock materials for geotechnical analysis and design of nuclear power facilities. It discusses requirements for laboratory facilities and test apparatus, including calibration of test devices; the handling and storage of samples; the selection and preparation of test specimens; and procedures that should be followed in testing. It gives special emphasis to testing for dynamic response analysis of soils, and discusses a number of pitfalls and sources of error in performing and interpreting cyclic tests. A table is provided in which various test methods for soil and rock are listed, together with references to published standard or preferred methods of test and references to other important or useful publications. (Author)

NUREG/CR-0407 PC **A11**/MF **A01**
Sandia Labs., Albuquerque, NM.
An Evaluation and Comparison of Nuclear Powerplant Siting Methodologies,
Ralph L. Keeney, Craig W. Kirkwood, Coleen K. Ford, John A. Robinson, and Peter Gottlieb. Mar 79, 227p SAND-78-1284
Prepared in cooperation with Woodward-Clyde Consultants, San Francisco, CA., and Dames and Moore, Los Angeles, CA.

Descriptors: *Nuclear power plants, *Site surveys, Planning, Methodology, Evaluation, Comparison, Utah, Illinois.

Methodologies for selection of nuclear powerplant sites obtained from recent licensing dockets were found to fit into six major categories. By means of decision analysis techniques, specific examples from each methodology were evaluated against a list of 18 attributes for an ideal methodology. Results showed a distinct preference among the methodologies which was independent of differences in preference structure among three individuals. Site selection methodologies were applied to areas in Utah and Illinois to determine whether the different methodologies would select the same candidate plant sites or not. Results were generally consistent, but some potential sites were eliminated prematurely by selection techniques which include exclusion principles rather than relative weighting techniques.

NUREG/CR-0951 PC **A03**/MF **A01**
Arizona Univ., Tucson. Dept. of Nuclear Engineering.
A Comparison of Piping Models for Digital Power Plant Simulators.
Thesis Sep 78-Jul 79,
Gerald W. Sowers. Aug 79, 48p

Descriptors: *Piping systems, *Mathematical models, Computerized simulation, Nuclear power plants, Electric power plants, Differential equations, Finite difference theory, Functions(Mathematics), Simulators, Comparison, Theses.
Identifiers: PIPE model, PDELAY model.

Two piping models intended for use in a digital power plant simulator are compared. One is a finite difference approximation to the partial differential equation called PIPE, and the other is a function subroutine that acts as a delay operator called PDELAY. The two models are compared with respect to accuracy and execution time. In addition, the stability of the PIPE model is determined. The PDELAY model is found to execute faster than the PIPE model with comparable accuracy.

NUREG-0090-V-2-1 PC **A03**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Management and Program Analysis.
Report to Congress on Abnormal Occurrences, January-March 1979. Volume 2, Number 1.
Quarterly rept.
Jul 79, 44p
See also report dated Mar 78, PB-279 580.

Descriptors: *Nuclear power plants, *Nuclear reactor accidents, Nuclear reactor safety, Piping systems.
Identifiers: Three Mile Island-2 reactor, Loss of coolant, Nuclear materials diversion, Nuclear facilities, Fuel fabrication plants, Extortion.

Section 208 of the Energy Reorganization Act of 1974 identifies an abnormal occurrence as an unscheduled incident or event which the Nuclear Regulatory Commission determines to be significant from the standpoint of public health or safety and requires a quarterly report of such events to be made to Congress. This report, the sixteenth in the series, covers the period January 1 to March 31, 1979. During this period, there were four abnormal occurrences. Three occurred at the 70 nuclear power plants licensed to operate; one was the nuclear accident at Three Mile Island, the second involved deficiencies in piping design, and the third involved degraded engineered safety systems. The fourth occurred at a fuel cycle facility and pertained, to an extortion attempt involving alleged theft of licensed material. This report also contains information updating a previously reported abnormal occurrence.

NUREG-0424-SUP-1 PC **A04**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Office of Nuclear Reactor Regulation.
Construction of New England Power Project, Units 1 and 2, New England Power Company, et al. Docket Nos. STN-50-568 and 50-569. Supplement Number 1.
Safety evaluation rept. 2 Jun 78-20 Jul 79,
Jul 79, 68p

Descriptors: *Nuclear reactor safety, *Nuclear power plants, Nuclear reactor sites, Rhode Island.
Identifiers: *NEP-1 reactor, *NEP-2 reactor.

The Nuclear Regulatory Commission's Safety Evaluation Report in the matter of the application by the New England Power Company and other utilities to construct and operate the proposed NEP Nuclear Generating Station, Units 1 and 2 (NEP 1 and 2 or facility) was issued on June 1, 1978. The purpose of this supplement is to update the Safety Evaluation Report by providing (1) the NRC's evaluation of additional information submitted by the applicants since the Safety Evaluation Report was issued, (2) the NRC's evaluation of the matter where it had not completed our review of information submitted by the applicants when the Safety Evaluation Report was issued, and (3) the NRC's responses to the comments made by the Advisory Committee on Reactor Safeguards in its report dated July 13, 1978, a copy of which is included as Appendix A to this supplement.

PATENT-4 129 476 Not available NTIS
Department of Energy, Washington, DC.
Environment Control System.
Patent,
D. G. Sammarone. Filed 28 Jul 76, patented 12 Dec 78, 12p PAT-APPL-709 473
Supersedes PAT-APPL-709 473-76.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Air cleaning systems, *Nuclear power plants, Design.
Identifiers: ERDA/220200, *Patents, Electric power plants, Air pollution control equipment.

For abstract, see ERA citation 04:042953.

PB-298 576/0GA PC **A10**/MF **A01**
Korea Atomic Energy Research Inst., Seoul.
Proceedings of the Symposium on Nuclear Power Technology Held at Seoul, Korea on November 1-6, 1977.
1978, 217p
Prepared in cooperation with Korean Nuclear Society, Seoul, and Korea Atomic Industrial Forum, Inc., Seoul.

Descriptors: *Nuclear electric power generation, *Meetings, Nuclear power, Technology, Korea, Canada, France, Japan, Nuclear reactor safety, Utilization.
Identifiers: *Foreign technology.

Contents:
- Nuclear power as a major alternative source of energy;
- World energy situation and utilization of nuclear power;
- Prospect of energy resources utilization and nuclear power program in Korea;
- Nuclear power safety and its environmental impact;
- CANDU--Present status and future prospects;
- Present status and prospect of nuclear power technology in France;
- Nuclear power in Japan--Today and tomorrow;
- Nuclear manpower development in Korea;
- Present status and prospects of nuclear power technology in the United States;
- Development of nuclear power industries in Korea;
- Nuclear power technology inducement (in Korea).

SAN-1011-119 PC **A06**/MF **A01**
Agbabian Associates, El Segundo, CA.
Review of Earthquake Vibratory Ground Motion Intensity Attenuation Relationships.
G. A. Young. 30 Sep 78, 104p
Contract EY-76-C-03-1011

Descriptors: *Earthquakes, *Nuclear power plants, *Ground motion, Reactor sites, Seismic effects, Seismology, Site selection.
Identifiers: ERDA/220501.

For abstract, see ERA citation 04:044813.

UCRL-52458 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Methods to Develop Site Specific Spectra and a Review of the Important Parameters That Influence the Spectra.
D. L. Bernreuter. May 79, 45p
Contract W-7405-ENG-48

Descriptors: *Earthquakes, *Nuclear power plants, Accelerometers, Data analysis, Errors, Forecasting, *Risk assessment, Seismic detection, Seismographs, Site selection, Usa.
Identifiers: ERDA/580201, ERDA/220501, *Seismic risk, Earthquake engineering.

For abstract, see ERA citation 04:045475.

18F. Radiation Shielding and Protection

LA-UR-78-3067 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Program to Develop Analytical Tools for Environmental and Safety Assessment of Nuclear Material Shipping Container Systems.
T. A. Butler. Nov 78, 13p CONF-781109-10
Contract W-7405-ENG-36
Environmental control symposium, Washington, DC, USA, 28 Nov 1978.

Descriptors: *Radioactive materials, Accidents, Containers, Dynamic loads, Impact shock, Mathematical models, Response functions, Safety, Transport.
Identifiers: ERDA/050900, ERDA/420204, *Shipping containers, Hazardous materials transportation.

For abstract, see ERA citation 04:029409.

LA-7803-MS PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Flux Effect on an Aligned Second Foil Due to Multiple Scattering of 800-MeV Protons in the Leading Foil.
C. A. Coulter, and W. F. Sommer. Apr 79, 8p
Contract W-7405-ENG-36

Descriptors: *Aluminium, *Protons, Alignment, Charged-particle transport, Flux density, Foils, Geometry, Isolated values, Mev range 100-1000, Multiple scattering, Proton reactions, Radiation dose distributions, Radiation length, Range, Theoretical data.
Identifiers: ERDA/654001.

For abstract, see ERA citation 04:044042.

NUREG/CR-0923 PC **A07**/MF **A01**
Sandia Labs., Albuquerque, NM.
Sensitivity Studies Using the TRNSM 2 Computerized Model for the NRC Physical Protection Project.
Final rept.,
G. M. Anderson. Jul 79, 140p SAND-78-8196
Prepared by ORINCON Corp., La Jolla, CA.

Descriptors: *Nuclear materials management, *Radioactive materials, Transportation management, Transportation models, Security, Aircraft, Trucks, Computer programming, Sensitivity.
Identifiers: *Hazardous materials transportation, TRNSM 2 model.

A computerized model of the transportation system for shipment of nuclear fuel cycle materials is required to investigate the effects on fleet size, fleet composition and efficiency of fleet utilization resulting from changes in a variety of physical and regulatory factors, including shipping requirements, security regulations, work rules, maintenance requirements, and vehicle capacities. Such a model has been developed which provides a capability for complete sizing requirements studies of a combined aircraft and truck fleet. This report presents the results of a series of sensitivity studies performed using this model. These studies include the effects of the intinerary optimization criteria, work rules, and maintenance policies. These results demonstrate the effectiveness and versatility of the model for investigating the effects of a wide variety of physical and regulatory factors on the transportation fleet.

ORNL/TM-6773 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Fourteenth Nuclear Accident Dosimetry Intercomparison Study: July 13--22, 1977.
C. S. Sims. Jun 79, 38p
Contract W-7405-ENG-26

Descriptors: Criticality, Personnel monitoring, *Radiation accidents, Comparative evaluations, HPRR reactor, Neutron dosimetry, *Radiation doses, Radiation monitoring, Reactor accidents, Simulation.
Identifiers: ERDA/220900, ERDA/054000, Dosimetry, Gamma rays.

For abstract, see ERA citation 04:044858.

SAND-78-1978 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Description of a Materials/Coolant Laboratory for Support of the Breeder Reactor Technology Shipping Program.
H. J. Rack, and R. W. Rohde. Apr 79, 27p
Contract EY-76-C-04-0789

Descriptors: *Spent fuel casks, Breeder reactors, Compatibility, Cooling systems, Materials, Performance testing, Safety, Test facilities.
Identifiers: ERDA/420204, Shipping containers.

For abstract, see ERA citation 04:043605.

18G. Radioactive Wastes and Fission Products

ADL-C-1065-1 PC **A04**/MF **A01**
Little (Arthur D.), Inc., Cambridge, MA.
Evaluation of Alternatives for Defense Waste Management at the Savannah River Plant: Phase I Report.
1 Aug 78, 57p
Contract EW-78-C-09-1065

Descriptors: *Radioactive waste management, Savannah River plant, Comparative evaluations, Evaluation, High-level radioactive wastes.
Identifiers: ERDA/052000.

For abstract, see ERA citation 04:040386.

AECL-6186 PC **A02**/MF **A01**
Atomic Energy of Canada Ltd., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
Radioactive Waste Management in Canada: A Bibliography of Published Literature.
N. J. Hawley. Sep 78, 23p
U.S. Sales Only.

Descriptors: *Radioactive waste management, AECL, Bibliographies, *Canada, Meetings.
Identifiers: ERDA/052000, ERDA/290600.

For abstract, see ERA citation 04:042396.

AECL-6318 PC **A04**/MF **A01**
Atomic Energy of Canada Ltd., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
GARD: A Computer Program for the Geochemical Assessment of Radionuclide Disposal.
E. L. J. Rosinger, and K. K. R. Tremaine. Dec 78, 55p
U.S. Sales Only.

Descriptors: Computer codes, *Radioactive waste disposal, *Radionuclide migration, Differential equations, G codes, Material balance, Radioactive waste facilities, Underground disposal.
Identifiers: ERDA/052002, ERDA/053000, ERDA/510301, Canada, *GARD computer program.

For abstract, see ERA citation 04:042417.

AECL-6322 PC **A02**/MF **A01**
Atomic Energy of Canada Ltd., Pinawa (Manitoba). Whiteshell Nuclear Research Establishment.
Risk Assessment for Radioactive Waste Disposal.
R. B. Lyon, and E. L. J. Rosinger. Jan 79, 21p
U.S. Sales Only.

Descriptors: *Radioactive waste disposal, Radioactive waste facilities, Radionuclide migration, Risk assessment, Rocks, Underground disposal.
Identifiers: ERDA/052002, ERDA/054000, Canada.

For abstract, see ERA citation 04:042418.

CONF-781121-18 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.

Field 18—NUCLEAR SCIENCES AND TECHNOLOGY

Group 18G—Radioactive Wastes and Fission Products

Physicochemical Characterization of Solidification Agents Used and Products Formed with Radioactive Wastes at LWR Nuclear Power Plants.
A. H. Kibbey, and H. W. Godbee. 1978, 5p
Contract W-7405-ENG-26
Annual meeting of Materials Research Society, Boston, MA, USA, 28 Nov 1978.

Descriptors: *Radioactive waste processing, Water cooled reactors, Cements, Organic polymers, Solidification, Waste processing.
Identifiers: ERDA/052001.

For abstract, see ERA citation 04:029426.

CONF-790331-2 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Role of Mathematical Modeling in Low-Level Radioactive Waste Management.
D. S. Ward, D. D. Huff, and L. D. Eyman. 1979, 14p
Contract W-7405-ENG-26
Waste management seminar, Oak Ridge, TN, USA, 6 Mar 1979.

Descriptors: Radioactive waste disposal, *Radionuclide migration, Hydrology, Low-level radioactive wastes, Mathematical models, ORNL, *Radioactive waste management, Simulation, Streams, Underground disposal.
Identifiers: ERDA/052002, ERDA/053000, ERDA/510301.

For abstract, see ERA citation 04:038260.

CONF-790420-10 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Development of Cermets for High Level Radioactive Waste Fixation.
W. S. Aaron, T. C. Quinby, and E. H. Kobisk. 1979, 15p
Contract W-7405-ENG-26
International symposium on ceramics in nuclear waste management, Cincinnati, OH, USA, 30 Apr 1979.

Descriptors: *Radioactive waste processing, *Cermets, High-level radioactive wastes, Radioactive waste management, Solidification.
Identifiers: ERDA/052001.

For abstract, see ERA citation 04:040415.

DP-1486 PC **A04**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Measured Weekly exp 85 Kr Concentrations with 150 Km of the Savannah River Plant (March 1975--August 1976).
M. M. Pendergast, A. L. Boni, G. J. Ferber, and K. Telegadas. May 79, 58p
Contract EY-76-C-09-0001

Descriptors: Environmental transport, *Krypton 85, *Radionuclide migration, *Savannah River plant, Surface air, Wind, Air pollution, Data acquisition, Data processing, Distance, Experimental data, Mathematical models, Radiation monitoring, Radioactive effluents, Sampling, Tables.
Identifiers: ERDA/500300, ERDA/500100, ERDA/500200, ERDA/053000.

For abstract, see ERA citation 04:043756.

DP-1518 PC **A03**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Transmutation of Waste Actinides in Light Water Reactors.
T. C. Gorrell. Apr 79, 49p
Contract EY-76-C-09-0001

Descriptors: *Radioactive waste management, *Actinides, Bwr type reactors, Pwr type reactors, Radioactive waste disposal, Transmutation.
Identifiers: ERDA/052002.

For abstract, see ERA citation 04:044381.

DPSPU-79-11-7 PC **A03**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Plant.
History of Tank 23, 1962 Through 1974.
F. G. McNatt. Apr 79, 44p
Contract EY-76-C-09-0001

Descriptors: *Radioactive waste facilities, Inspection, Performance, Radioactive waste storage, Savannah river plant, Steel-ASTM-A212, Tanks, Underground storage.
Identifiers: ERDA/052002.

For abstract, see ERA citation 04:044382.

GA-A-14978 PC **A04**/MF **A01**
General Atomic Co., San Diego, CA.
Stress and Vibration Measurement in the Uniframe Cold Engineering-Scale HTGR Fuel Element Size Reduction System.
R. D. Crabtree, G. T. Cramer, and E. J. Steeger. May 79, 69p
Contract EY-76-C-03-0167-053

Descriptors: Htgr type reactors, *Spent fuel elements, Crushing, Experimental data, Fuel cycle, Isolated values, Measuring instruments, Performance, Strain gages, Tools.
Identifiers: ERDA/050800.

For abstract, see ERA citation 04:044372.

ICP-1179 PC **A07**/MF **A01**
Allied Chemical Corp., Idaho Falls, ID. Idaho Chemical Programs - Operations Office.
Technical Division Quarterly Progress Report, July 1--September 30 1978.
D. L. Plung. Jan 79, 128p
Contract EY-76-C-07-1540

Descriptors: Idaho chemical processing plant, *Radioactive waste management, Actinides, Calcination, High-level radioactive wastes, Krypton 85, Radioactive waste processing, Radioactive waste storage, Reprocessing, Research programs, Separation processes, Solidification, Spent fuels.
Identifiers: ERDA/052001, ERDA/052002, ERDA/050800, Carbon monoxide, Carbon dioxide.

For abstract, see ERA citation 04:042404.

IS-4679 PC **A04**/MF **A01**
Ames Lab., IA.
Environmental Monitoring at Ames Laboratory: Calendar Year 1978.
M. D. Voss. Apr 79, 58p
Contract W-7405-ENG-82

Descriptors: *Ames laboratory, *Radioactive effluents, Atmospheric precipitations, Sediments, Streams, Surface air, Wells, Chemical effluents, Water pollution, Experimental data, Tables, Alpha sources, Antimony 125, Beryllium 7, Beta sources, Cerium 144, Cesium 137, Cobalt 60, Gaseous wastes, Liquid wastes, Neodymium isotopes, *Radiation monitoring, Radioactivity, Ruthenium 106, Silver 110, Tritium, Zinc 65, Zirconium 95, Cerium 141, Niobium 95, Ruthenium 103, Chlorine, Chromium, Monitoring, Zinc.
Identifiers: ERDA/500300, ERDA/520300, ERDA/520200, ERDA/053000, ERDA/220502.

For abstract, see ERA citation 04:045359.

LA-7480-MS PC **A04**/MF **A01**
Los Alamos Scientific Lab., NM.
Sorption--Desorption Studies on Tuff. I. Initial Studies with Samples from the J-13 Drill Site, Jackass Flats, Nevada.
K. Wolfsberg, B. P. Bayhurst, B. M. Crowe, W. R. Daniels, and B. R. Erdal. Apr 79, 60p
Contract W-7405-ENG-36

Descriptors: *Radioisotopes, *Tuff, Ambient temperature, Desorption, Geochemistry, Ground water, Mineralogy, Nevada test site, Radioactive waste storage, Radionuclide migration, Sorption, Sorptive properties, Underground storage, Wells.
Identifiers: ERDA/500300, ERDA/580400, ERDA/052002.

For abstract, see ERA citation 04:043760.

LA-7699 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Irradiated Fuel Monitors: Preliminary Feasibility Study.
E. J. Dowdy, and J. T. Caldwell. May 79, 18p
Contract W-7405-ENG-36

Descriptors: Fuel pools, Spent fuel elements, Accounting, Cadmium tellurides, Cherenkov counters, Feasibility studies, Inventories, Ionization chambers, Mercury iodides, Neutron detectors, Radiation monitoring, Safeguards, Scintillation counters, Storage facilities, Thermoluminescent dosemeters.
Identifiers: ERDA/055001, *Radioactive waste management.

For abstract, see ERA citation 04:042444.

LA-7706-PR PC **A04**/MF **A01**
Los Alamos Scientific Lab., NM.
Nuclear Safeguards Research and Development. Program Status Report, September--December 1978.
S. D. Gardner. May 79, 54p
Contract W-7405-ENG-36

Descriptors: Safeguards, Monitoring, Nondestructive analysis, Physical protection devices, Research programs.
Identifiers: ERDA/055001, *Nuclear safeguards, Nuclear materials management.

For abstract, see ERA citation 04:044403.

LBL-7096 PC **A11**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Geotechnical Assessment and Instrumentation Needs for Nuclear Waste Isolation in Crystalline and Argillaceous Rocks.
Jan 79, 229p CONF-780730-
Contract W-7405-ENG-48
Geotechnical assessment and instrumentation needs symposium, Berkeley, CA, USA, 16 Jul 1978.

Descriptors: *Radioactive waste disposal, *Rocks, Argillite, Fractures, Geochemistry, Geologic fissures, Hydrology, Measuring instruments, Meetings, Recommendations, Research programs, Underground disposal.
Identifiers: ERDA/052002, ERDA/580100.

For abstract, see ERA citation 04:044384.

MHSMP-79-24 PC **A04**/MF **A01**
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX.
Environmental Monitoring Report for Pantex Plant Covering 1978.
R. E. Alexander, and V. A. Cornelius. May 79, 53p
Contract EY-76-C-04-0487

Descriptors: *Pantex plant, Alpha sources, Beta sources, Earth atmosphere, Ground water, Radium 226, Radium 228, Surface waters, *Tritium oxides, Soils, Plants, Rabbits, Air pollution, Water pollution, Experimental data, Tables, Carbon monoxide, Chemical effluents, Monitoring, Nitrogen oxides, Plutonium 239, *Radiation monitoring, *Radioactive effluents, Tritium, Uranium 238, Radioactivity, Kidneys, Liver, Lungs, Muscles, Radionuclide kinetics, Skeleton, Tissue distribution.
Identifiers: ERDA/500300, ERDA/510302, ERDA/520301, ERDA/500200, ERDA/520200.

For abstract, see ERA citation 04:043761.

MLM-2611 PC **A02**/MF **A01**
Mound facility, Miamisburg, OH.
Development of Ultrafiltration and Adsorbents: October 1978--March 1979.
W. R. Herald, and R. C. Roberts. 14 May 79, 22p
Contract EY-76-C-04-0053

Descriptors: Adsorbents, *Radioactive waste processing, Ultrafiltration, Adsorption, Americium 241, Liquid wastes, Membranes, Research programs.
Identifiers: ERDA/052001.

For abstract, see ERA citation 04:044378.

MLM-2614 PC **A02**/MF **A01**
Mound Facility, Miamisburg, OH.
Pelletized Waste Form Demonstration Program: October 1978--March 1979.
E. L. Lewis, and R. F. Herbert, Jr. 15 May 79, 14p
Contract EY-76-C-04-0053

Descriptors: *Radioactive waste processing, Additives, Ashes, Demonstration programs, Feasibility studies, Leaching, Pellets, Portland cement, Radiolysis, Research programs, Sludges, Solidification.
Identifiers: ERDA/052001.

For abstract, see ERA citation 04:044379.

MLM-2618 PC **A02**/MF **A01**
Mound Facility, Miamisburg, OH.
Defense Waste Cyclone Incinerator Demonstration Program: October--March 1979.
L. M. Klinger. 22 May 79, 14p
Contract EY-76-C-04-0053

Descriptors: Incinerators, *Radioactive waste processing, Combustion, Demonstration programs, Design, Transuranium elements, Volume.
Identifiers: ERDA/052001.

For abstract, see ERA citation 04:044380.

ORNL/TM-6866 PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
High-Level Waste Program. Progress Report, October 1, 1978--March 31, 1979.
R. E. Blanco, and A. L. Lotts. May 79, 54p
Contract W-7405-ENG-26

Descriptors: *Radioactive waste management, *Radioactive waste processing, Cermets, Concretes, Leaching, Research programs, Sintering, Solidification.
Identifiers: ERDA/052000, *High-level radioactive waves, Mathematical models, Computer programming, ORIGEN computer program.

For abstract, see ERA citation 04:044376.

PNL-2899 PC **A05**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Radiological Status of the Ground-Water Beneath the Hanford Project, January--December 1978.
P. A. Eddy. Apr 79, 81p
Contract EY-76-C-06-1830

Descriptors: Aquifers, Beta sources, *Ground water, Nitrates, Tritium, Chemical effluents, Contamination, Environmental transport, Experimental data, Hanford reservation, Isolated values, Monitoring, Radiation monitoring, *Radioactive effluents, Radioactivity, Radionuclide migration, Water pollution.
Identifiers: ERDA/520301, ERDA/520200, ERDA/053000.

For abstract, see ERA citation 04:043788.

RHO-BWI-79-100-1Q PC **A04**/MF **A01**
Atomics International Div., Richland, WA. Rockwell Hanford Operations.
Basalt Waste Isolation Program. Quarterly Report, October 1--December 31, 1978.
R. A. Deju. Jan 79, 51p
Contract EY-77-C-06-1030

Descriptors: *Radioactive waste facilities, *Basalt, Geology, Hydrology, Radioactive waste storage, Research programs, Site selection, Test facilities, Underground storage.
Identifiers: ERDA/052002.

For abstract, see ERA citation 04:038272.

RHO-SA-26 PC **A03**/MF **A01**
Atomics International Div., Richland, WA. Rockwell Hanford Operations.
Ground-Water Hydrology and Radioactive Waste Disposal at the Hanford Site.
A. G. Law. Feb 79, 35p CONF-790219-9
Contract EY-77-C-06-1030
AIME annual meeting, New Orleans, LA, USA, 18 Feb 1979.

Descriptors: *Hanford reservation, *Radioactive waste disposal, Aquifers, *Ground water, Hydrology, Underground disposal.
Identifiers: ERDA/052002, ERDA/520100, Washington(State).

For abstract, see ERA citation 04:042424.

RHO-ST-17 PC **A10**/MF **A01**
Atomics International Div., Richland, WA. Rockwell Hanford Operations.
Distribution of Plutonium and Americium Beneath the 216-Z-1A Crib: A Status Report.
S. M. Price, R. B. Kasper, M. K. Additon, R. M. Smith, and G. V. Last. Feb 79, 221p
Contract EY-77-C-06-1030

Descriptors: *Americium, *Plutonium, *Radioactive waste disposal, Soils, Contamination, Depth, *Radionuclide migration, Sampling, Sediments, Spatial distribution, Wells.
Identifiers: ERDA/052002, ERDA/510301.

For abstract, see ERA citation 04:042426.

SAND-77-0736 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Entrainment of a Developing Plume into Convective Cells.
J. R. Wayland, Jr., and L. T. Ritchie. Apr 79, 27p
Contract EY-76-C-04-0789

Descriptors: Nuclear power plants, *Reactor accidents, Atmospheric precipitations, Environmental impacts, Fission product release, Plumes, Radiation hazards, *Radioactive effluents, Radionuclide migration.
Identifiers: ERDA/220502, Rainfall, Radiation hazards.

For abstract, see ERA citation 04:044815.

SAND-78-0893 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Interaction of Radionuclides with Argillite from the Eleana Formation on the Nevada Test Site.
R. G. Dosch, and A. W. Lynch. Feb 79, 50p
Contract EY-76-C-04-0789

Descriptors: Americium 243, *Argillite, Cerium 144, Cesium 137, Curium 244, Europium 152, Plutonium 238, Strontium 85, Technetium 99, Adsorption, Aqueous solutions, Experimental data, Ground water, Nevada test site, pH value, Rocks, Simulation, Sorptive properties, Tables.
Identifiers: ERDA/052002, ERDA/510301, *Radioactive wastes, Radioactive waste disposal.

For abstract, see ERA citation 04:044391.

SAND-78-1730 PC **A08**/MF **A01**
Sandia Labs., Albuquerque, NM.
Scenarios for Long-Term Release of Radionuclides from a Nuclear-Waste Repository in the Los Medanos Region of New Mexico.
F. W. Bingham, and G. E. Barr. May 79, 167p
Contract EY-76-C-04-0789

Descriptors: New Mexico, *Radioactive waste storage, Aquifers, Criticality, Leaching, Probability, Radioactive waste facilities, *Radionuclide migration, Sabotage, Underground storage.
Identifiers: ERDA/052002, ERDA/053000.

For abstract, see ERA citation 04:044392.

SAND-79-0402C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Evaluation of Tuff as a Waste Isolation Medium.
L. D. Tyler. 1979, 20p CONF-790204-8
Contract EY-76-C-04-0789
Symposium on waste management and fuel cycles 1979, Tucson, AZ, USA, 28 Feb 1979.

Descriptors: *Radioactive waste disposal, *Tuff, Compression strength, Density, Evaluation, Geologic deposits, Nevada test site, Permeability, Physical properties, Poisson ratio, Porosity, Sorptive properties, Specific heat, Tensile properties, Thermal conductivity, Young modulus.
Identifiers: ERDA/052002, ERDA/580300.

For abstract, see ERA citation 04:032646.

UCID-17831 PC **A09**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Site Suitability Criteria for Solidified High Level Waste Repositories.
R. A. Heckman, T. Holdsworth, D. Isherwood, D. F. Towse, and N. L. Dayem. 3 Apr 79, 197p
Contract W-7405-ENG-48

Descriptors: *Radioactive waste facilities, *Radioactive waste storage, Documentation, High-level radioactive wastes, Plutonium recycle, Radiation hazards, Radionuclide migration, Regulations, Risk assessment, Site selection, Uranium, US NRC.
Identifiers: ERDA/052002.

For abstract, see ERA citation 04:035928.

UCID-18122 PC **A04**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Preliminary Area Selection Considerations for Radioactive Waste Repositories in Bedded Salt.
J. L. Wagoner, and T. L. Steinborn. 12 Jun 79, 52p
Contract W-7405-ENG-48

Descriptors: *Radioactive waste facilities, Radioactive waste storage, Salt deposits, Site selection, Underground storage.
Identifiers: ERDA/052002.

For abstract, see ERA citation 04:044393.

UCRL-13998-1 PC **A02**/MF **A01**
Kaplan and Associates, Inc., Livermore, CA.
Notes on the LLL/NRC Waste Disposal Study. I, Analytical Framework.
Mar 78, 22p
Contract W-7405-ENG-48

Descriptors: *Radioactive waste disposal, Environmental impacts, Risk assessment, US NRC.
Identifiers: ERDA/052002, ERDA/054000.

For abstract, see ERA citation 04:040433.

UCRL-13998-2 PC **A02**/MF **A01**
Kaplan and Associates, Inc., Livermore, CA.
Notes on the LLL/NRC Waste Disposal Study. II, Probabilistic Arithmetic.
May 78, 20p
Contract W-7405-ENG-48

Descriptors: *Radioactive waste disposal, Decision making, Mathematics, Probability, Risk assessment.
Identifiers: ERDA/052002, ERDA/054000.

For abstract, see ERA citation 04:040434.

WAPD-TM-1394 PC **A04**/MF **A01**
Bettis Atomic Power Lab., West Mifflin, PA.
Iodine and Cesium in Oxide Fuel Pellets and Zircaloy-4 Cladding of Irradiated Fuel Rods (LWBR Development Program).
D. M. Ivak, and L. A. Waldman. Mar 79, 54p
Contract EY-76-C-11-0014

Descriptors: *Cesium, *Iodine, Lwbr type reactors, *Spent fuel elements, Electron microprobe analysis, Fission product release, Fuel cans, Fuel pellets, Fuel rods, Radiation monitoring, Radiochemical analysis, Thorium oxides, Uranium dioxide, Zircaloy 4.
Identifiers: ERDA/050700, ERDA/400103.

For abstract, see ERA citation 04:040361.

Y/OWI/SUB-7118/1 PC **A06**/MF **A01**
Minnesota Univ., Minneapolis. Dept. of Civil and Mining Engineering.
Thermoelastic Analysis of Spent Fuel and High Level Radioactive Waste Repositories in Salt. A Semi-Analytical Solution.
C. M. St. John. Apr 77, 106p
Contract W-7405-ENG-26

Descriptors: Computer codes, *Radioactive waste storage, *Spent fuel storage, Analytical solution, High-level radioactive wastes, J codes, Storage facilities, Stress analysis, Temperature gradients, Thermoelasticity, Underground storage.
Identifiers: ERDA/052002, ERDA/990200, ERDA/050900, *Salt deposits, Computer program documentation.

For abstract, see ERA citation 04:042429.

Y/OWI/TM-43/8 PC **A04**/MF **A01**
Union Carbide Corp., Oak Ridge, TN. Office of Waste Isolation.
Office of Waste Isolation Progress Report, May 1978.
R. C. Rhines. May 78, 69p
Contract W-7405-ENG-26

Descriptors: *Radioactive waste storage, Research programs, Underground storage.
Identifiers: ERDA/052002, Avery Island mine, Louisiana.

For abstract, see ERA citation 04:040435.

18H. Radioactivity

COO-4546-2 PC **A02**/MF **A01**
Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
Measurement of exp 222 RN Build-Up in Solar Heated Buildings and Calculation of Radiation Doses. Final Report of Innovative Research Program Subtask, December 1977--September 1978.
J. E. Johnson, and H. G. Olson. Oct 78, 7p
Contract EG-77-S-02-4546

Descriptors: Rock beds, Thermal energy storage equipment, Houses, Radioactivity, *Radon 222, Sensible heat storage, *Solar heating systems.
Identifiers: ERDA/142000.

For abstract, see ERA citation 04:044653.

FERMILAB-79/26 PC **A04**/MF **A01**
Fermi National Accelerator Lab., Batavia, IL.
Environmental Monitoring Report for Calendar Year 1978.
S. I. Baker. 1 May 79, 58p
Contract EY-76-C-02-3000

Descriptors: Beryllium, Environment, *Fermilab accelerator, Gamma radiation, Muons, Neutrons, Protons, Radioactive wastes, Tritium, Copper, Dose rates, Environmental effects, Experimental data, Graphs, Isolated values, Monitoring, *Radiation doses, Radiotherapy, Standards, Synchrotrons, Water pollution.
Identifiers: ERDA/520300, ERDA/560151, ERDA/560161.

For abstract, see ERA citation 04:045399.

MLM-2621 PC **A03**/MF **A01**
Mound Facility, Miamisburg, OH.
Environmental Monitoring During Construction of the Miamisburg Solar and Fishing Ponds.
B. M. Farmer, and D. G. Carfagno. 8 Jun 79, 26p
Contract EY-76-C-04-0053

Descriptors: Construction, Particles, Plutonium 238, Plutonium 239, *Solar ponds, Surface air, Air pollution, Dose commitments, Dose equivalents, Monitoring, Ohio, Particle resuspension, *Radiation monitoring, Radioactivity, Recreational areas.
Identifiers: ERDA/500300, ERDA/500200, ERDA/510301, ERDA/560171, *Ponds, Radiation dosage.

For abstract, see ERA citation 04:045360.

SAND-79-1033 PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Environmental Monitoring Report, Sandia Laboratories 1978.
T. N. Simmons. May 79, 19p
Contract EY-76-C-04-0789

Descriptors: Argon 41, Beta particles, Cesium 137, Human populations, Plants, Soils, Tritium, Uranium, Water, Dose rates, Experimental data, Isolated values, Radiation monitoring, *Radioecological concentration.
Identifiers: ERDA/520300, ERDA/510300, ERDA/560161.

For abstract, see ERA citation 04:043786.

18I. Reactor Engineering and Operation

ALO-0789-T5 PC **A02**/MF **A01**
Argonne National Lab., IL.
Integrated IAEA Safeguards Concepts for Nuclear Critical Facilities.
Apr 79, 18p
Contract EY-76-C-04-0789

Descriptors: *Nuclear materials diversion, Zero power reactors, Detection, IAEA safeguards, Inventories, Plutonium.
Identifiers: ERDA/055001, *Nuclear materials management.

For abstract, see ERA citation 04:044402.

BNL-NUREG-25421 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Applicability of Microwave Heating to the Simulation of the LMFBR Meltdown Process.
H. Makowitz, and T. Ginsberg. Dec 78, 7p
CONF-790602-11
Contract EY-76-C-02-0016
ANS annual meeting, Atlanta, GA, USA, 3 Jun 1979.

Descriptors: *Lmfbr type reactors, *Meltdown, Microwave radiation, Radiation heating, Reactor core disruption, Simulation.
Identifiers: ERDA/220900, ERDA/210500, Nuclear reactor accidents.

For abstract, see ERA citation 04:040911.

BNL-50976 PC **A10**/MF **A01**
Brookhaven National Lab., Upton, NY.
Fast-Mixed Spectrum Reactor Interim Report Initial Feasibility Study.
G. J. Fischer, and R. J. Cerbone. Jan 79, 201p
Contract EY-76-C-02-0016

Descriptors: *Fast reactors, *Mixed spectrum reactors, Design, Feasibility studies, Fuel cycle, Performance, Reaction kinetics, Specifications.
Identifiers: ERDA/220100.

For abstract, see ERA citation 04:044800.

CAAP-TR-046 PC **A04**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Improved RELAP4 Jet Pump Model.
E. E. Ross. Apr 79, 60p
Contract EY-76-C-07-1570

Descriptors: *Bwr type reactors, *Loss of coolant, *Pumps, Computer calculations, Flow rate, Hydraulics, Mathematical models, Performance, Pressure gradients, Reactor safety.
Identifiers: ERDA/220900, ERDA/210100, RELAP4 computer program.

For abstract, see ERA citation 04:040914.

CONF-781146-4 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
Preliminary Multirod Burst Test Program Results and Implications of Interest to Reactor Safety Evaluations.
R. H. Chapman. 1978, 36p
Contract W-7405-ENG-26
Water reactor safety research meeting, Germantown, MD, USA, 6 Nov 1978.

Descriptors: Bwr type reactors, *Fuel element failure, *Loss of coolant, Pwr type reactors, Creep, Deformation, High temperature, Simulation, Very high temperature, Zircaloy 4.
Identifiers: ERDA/220900, ERDA/210100, ERDA/210200.

For abstract, see ERA citation 04:030191.

CONF-790423-10 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Evaluation of the Effect of Break Nozzle Configuration in Loss-of-Coolant Accident Analysis.
R. G. Hanson. 1979, 12p
Contract EY-76-C-07-1570
Multiphase flow and heat transfer symposium workshop, Miami Beach, FL, USA, 16 Apr 1979.

Descriptors: *Loss of coolant, *Pwr type reactors, Configuration, Failures, Hydraulics, Nozzles, Pipes, Reactor cooling systems, Simulation.
Identifiers: ERDA/220900, ERDA/210200, Nuclear reactor accidents.

For abstract, see ERA citation 04:040936.

CONF-790423-11 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Heat Transfer Considerations for the First Nuclear Blowdowns.
J. W. Spore, M. M. Giles, and D. R. Evans. 1979, 9p
Contract EY-76-C-07-1570
Multiphase flow and heat transfer symposium workshop, Miami Beach, FL, USA, 16 Apr 1979.

Descriptors: *Blowdown, *Pwr type reactors, Heat transfer, PBR reactor, Reactor experimental facilities, Reactor operation, Simulation.
Identifiers: ERDA/220900, ERDA/210200, ERDA/420400.

For abstract, see ERA citation 04:042991.

CONF-790430-2 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Applying New Safeguards Technology to Existing Nuclear Facilities.
C. E. Johnson, and E. P. Wagner. 1979, 10p
Contract EY-76-C-07-1570
Annual symposium on safeguards and nuclear material management, Brussels, Belgium, 25 Apr 1979.

Descriptors: Idaho chemical processing plant, *Nuclear facilities, Safeguards, Design, Measuring instruments.
Identifiers: ERDA/055001, *Nuclear safeguards.

For abstract, see ERA citation 04:038289.

CONF-790441-2 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
LOFT Nuclear Fuel Rod Behavior.
D. A. Niebruegge, and E. L. Tolman. 1979, 4p
Contract EY-76-C-07-1570
ANS topical meeting on light water reactor fuel performance, Portland, OR, USA, 29 Apr 1979.

Descriptors: *Loft reactor, Fuel cans, *Fuel rods, Heat transfer, Hydraulics, Loss of coolant, Mathematical models, Performance, Temperature gradients.
Identifiers: ERDA/220600.

For abstract, see ERA citation 04:040900.

CONF-790602-13 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Analysis of the General Electric Company Swell Tests with RELAP4/MOD7.
S. R. Fischer, and C. E. Hendrix. 1979, 6p
Contract EY-76-C-07-1570
ANS annual meeting, Atlanta, GA, USA, 3 Jun 1979.

Descriptors: *Blowdown, *Bwr type reactors, Dynamic loads, Loss of coolant, Pressure suppression, Simulation, Test facilities.
Identifiers: ERDA/220900, ERDA/210100, Nuclear reactor safety, RELAP4/MOD7 computer program.

For abstract, see ERA citation 04:042995.

CONF-790602-16 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Steam Generator Tube Rupture Effects on a LOCA.
J. L. LaChance. 1979, 4p
Contract EY-76-C-07-1570
ANS annual meeting, Atlanta, GA, USA, 3 Jun 1979.

Descriptors: *Loss of coolant, *Pwr type reactors, *Steam generators, Computer calculations, Failures, Tubes.
Identifiers: ERDA/220900, ERDA/210200, Nuclear reactor accidents, FLOOD4 computer program.

For abstract, see ERA citation 04:040939.

CONF-790602-17 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
LOFT Fuel Design and Operating Experience.
M. L. Russell. 1979, 4p
Contract EY-76-C-07-1570
ANS annual meeting, Atlanta, GA, USA, 3 Jun 1979.

Descriptors: *Loft reactor, Design, *Fuel element clusters, Fuel elements, Performance, Reactor cores.
Identifiers: ERDA/220600.

For abstract, see ERA citation 04:040902.

CONF-790602-19 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
LOFT Blowdown Experiment Safety Analysis Methodology.
J. L. Perryman, C. H. Cooper, and T. K. Samuels. 1979, 6p
Contract EY-76-C-07-1570
ANS annual meeting, Atlanta, GA, USA, 3 Jun 1979.

Descriptors: *Loft reactor, *Blowdown, ECCS, Mathematical models, Reactor safety experiments.

Identifiers: ERDA/220900, ERDA/220600.

For abstract, see ERA citation 04:040940.

CONF-790602-22 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Fuel Rod Response During LOFT Test L2-2.
D. A. Niebruegge, and E. L. Tolman. 1979, 4p
Contract EY-76-C-07-1570
ANS annual meeting, Atlanta, GA, USA, 3 Jun 1979.

Descriptors: LOFT reactor, Loss of coolant, Reactor experimental facilities, Reactor operation, Simulation.
Identifiers: ERDA/220600, *Nuclear fuel rods, *Nuclear reactor safety.

For abstract, see ERA citation 04:042970.

CONF-790615-2 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Considerations of Scaling Effects in the LOFT Reactor System During a Large Break LOCA Simulation.
M. A. Langerman, and E. A. Harvego. 1979, 4p
Contract EY-76-C-07-1570
US national congress on pressure vessels and piping, San Francisco, CA, USA, 25 Jun 1979.

Descriptors: *Loft reactor, *Pwr type reactors, Accuracy, *Loss of coolant, Mockup, Reactor safety, Simulation, Test facilities.
Identifiers: ERDA/220900, ERDA/220600, ERDA/210200, Scale(Ratio).

For abstract, see ERA citation 04:040944.

COO-2245-64 PC **A03**/MF **A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of Nuclear Engineering.
Coolant Mixing in LMFBR Rod Bundles and Outlet Plenum Mixing Transients. Progress Report, March 1, 1978--May 31, 1978.
N. E. Todreas, M. W. Golay, and L. Wolf. 1978, 37p
Contract EY-76-S-02-2245

Descriptors: *Fuel element clusters, *Lmfbr type reactors, Clinch River breeder reactor, Data, Fftf reactor, Flow rate, Fluid flow, Mathematical models, Mixing, Mockup, Natural convection, Research programs, Simulation, Sodium, Temperature distribution, Turbulence.
Identifiers: ERDA/210500, ERDA/420400, Interferometers, Laser Doppler anemometers.

For abstract, see ERA citation 04:042914.

COO-2571-14 PC **A08**/MF **A01**
Brigham Young Univ., Provo, UT. Dept. of Chemical Engineering.
Improvement and Verification of Fast Reactor Safety Analysis Techniques. Progress Report, July 1, 1978--September 30, 1978.
D. H. Barker, P. Wheeler, and D. J. Bybee. 1978, 169p
Contract EY-76-S-02-2571

Descriptors: *Lmfbr type reactors, *Reactor core disruption, Simulation, Void fraction.
Identifiers: ERDA/220900, ERDA/210500, *Nuclear reactor safety, Acetyl chloride, Benzene, Sulfoxide/dimethyl.

For abstract, see ERA citation 04:040945.

COO-2826-11 PC **A07**/MF **A01**
Purdue Univ., Lafayette, IN. School of Nuclear Engineering.
Fast Breeder Blanket Facility. Quarterly Progress Report, October 31, Dec 1978--December 31, 1978.
F. M. Clikeman. Dec 78, 131p
Contract EY-76-S-02-2826

Descriptors: *Subcritical assemblies, *Indium 115 target, *Neutron reactions, Design, Floods, Reactor safety, Research programs, Capture, Inelastic scattering, Reaction kinetics.
Identifiers: ERDA/220900, ERDA/220600.

For abstract, see ERA citation 04:040947.

DOE/ET-0030/1(79) PC **A03**/MF **A01**
Department of Energy, Washington, DC. Div. of Nuclear Power Development.
US Central Station Nuclear Electric Generating Units: Significant Milestones (Status as of January 1, 1979).
Mar 79, 26p

Descriptors: *Nuclear power plants, *Reactor operation, Construction, Cost, Data, Forecasting, USA.
Identifiers: ERDA/210000, ERDA/290600.

For abstract, see ERA citation 04:042875.

DOE/IR-0049 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Office of Education, Business and Labor Affairs.
Employment in Nuclear Energy Activities, 1977: A Highlights Report.
May 79, 30p

Descriptors: *Nuclear industry, *Employment, Experimental data, Personnel, Tables.
Identifiers: ERDA/290600, ERDA/290200, ERDA/990100.

For abstract, see ERA citation 04:043202.

DOE/TIC-10050 PC **A04**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Application of the Response Surface Method of Uncetainty Analysis to Establish Distributions of FRAPS3 Calculated Stored Energy for PWR-Type Fuels.
J. D. Kerrigan, and D. R. Coleman. 52p
Contract EY-76-C-07-1570

Descriptors: *Fuel elements, *Pwr type reactors, Burnup, Computer calculations, F codes, Mathematical models, Stored energy.
Identifiers: ERDA/210200, FRAP-S3 computer program, Nuclear reactor safety.

For abstract, see ERA citation 04:040828.

DOE/TIC-10102 PC **A02**/MF **A01**
Argonne National Lab., IL.
Analysis of TREAT Tests L7 and L8 with SAS3D, LEVITATE and PLUTO2.
C. H. Bowers, A. M. Tentner, and H. U. Wider. 1979, 17p
Contract W-31-109-ENG-38

Descriptors: *Lmfbr type reactors, Loss of flow, Reactor core disruption, Computer calculations, *Fuel pins, Mathematical models, Motion, Reactor safety.
Identifiers: ERDA/220900, ERDA/210500.

For abstract, see ERA citation 04:040948.

DP-MS-78-73 PC **A02**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Response of a Double Tube Sheet Structure to Hydraulic Pressure Transients.
W. F. Yau, and S. D. Harris. 1979, 15p CONF-790615-8
Contract EY-76-C-09-0001
US national congress on pressure vessels and piping, San Francisco, CA, USA, 25 Jun 1979.

Descriptors: *K reactor, *P reactor, *R reactor, Dynamic loads, Loss of coolant, Pressure gradients, Reactor components, Reactor cores, Response functions, Stress analysis.
Identifiers: ERDA/220900, ERDA/220700, *Nuclear reactor safety.

For abstract, see ERA citation 04:043001.

HEDL-SA-1518 PC **A02**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Experimental Fuel Assembly Irradiation Experience in EBR II.
R. J. Jackson, S. Kaplan, and A. Schwaille. Nov 78, 19p CONF-790306-8
Contract EY-76-C-14-2170
International conference on fast breeder reactor performance, Monterey, CA, USA, 5 Mar 1979.

Descriptors: Fftf reactor, *Fuel element clusters, *Lmfbr type reactors, Irradiation, Performance testing.
Identifiers: ERDA/210500, ERDA/220600.

For abstract, see ERA citation 04:040843.

HEDL-SA-1595-FP PC **A02**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Boilup Threshold for the Bottled-Up Transition Phase Pool.
F. J. Martin. Oct 78, 7p CONF-781105-95
Contract EY-76-C-14-2170
ANS meeting, Washington, DC, USA, 12 Nov 1978.

Descriptors: *Lmfbr type reactors, *Meltdown, Adiabatic processes, Corium, Hydrodynamics, Pool boiling, Pressurizing.
Identifiers: ERDA/220900, ERDA/210500.

For abstract, see ERA citation 04:043003.

HEDL-TME-78-80 PC **A06**/MF **A01**
Hanford Engineering Development Lab., Richland, WA.
Experimental Study of Hydrogen Jet Ignition and Jet Extinguishment.
R. W. Wierman. Apr 79, 114p
Contract EY-76-C-14-2170

Descriptors: Atmospheres, Lmfbr type reactors, *Meltdown, Combustion, Concretes, Corium, Hydrogen, Reactor safety, Reactor vessels, Sodium, Test facilities.
Identifiers: ERDA/220900, ERDA/210500, Nuclear reactor accidents.

For abstract, see ERA citation 04:044846.

LA-UR-78-2873 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Comparison of Elastic--Plastic and Variable Modulus-Cracking Constitutive Models for Prestressed Concrete Reactor Vessels.
C. A. Anderson, and P. D. Smith. 1978, 12p CONF-781144-4
Contract W-7405-ENG-36
US-Japan seminar on HTGR safety technology, Fuji, Japan, 24 Nov 1978.

Descriptors: Htgr type reactors, *Pressure vessels, Prestressed concrete, Cracks, Ductility, Elasticity, Finite element method, Mathematical models, Plasticity, Reinforced concrete, Stress analysis, Thickness, Walls.
Identifiers: ERDA/220900, ERDA/210300, ERDA/360603.

For abstract, see ERA citation 04:033577.

LA-UR-79-1073 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Data Analysis for Nuclear Materials Accounting.
J. P. Shipley. 24 Apr 79, 6p CONF-790430-11
Contract W-7405-ENG-36
Annual symposium on safeguards and nuclear material management, Brussels, Belgium, 25 Apr 1979.

Descriptors: Accounting, *Nuclear materials management, Data analysis, Decision tree analysis, Fuel cycle, Nuclear facilities.
Identifiers: ERDA/055001.

For abstract, see ERA citation 04:040460.

LA-7751-P PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Proposal for the Transmittal of Data to LASL and the Reporting of TRAC Analyses for the Multinational Reflood Experimental Program.
P. B. Bleiweis, W. L. Kirchner, and J. M. Sicilian. Apr 79, 16p
Contract W-7405-ENG-36

Descriptors: *Pwr type reactors, *Reactor safety experiments, Computer calculations, Coordinated research programs, Core flooding systems, *Data processing, Heat transfer, Hydraulics, Loss of coolant, T codes.
Identifiers: ERDA/220900, ERDA/210200.

For abstract, see ERA citation 04:040955.

MLM-2610(OP) PC **A02**/MF **A01**
Monsanto Research Corp., Miamisburg, OH.
Dynamic Calibration: A Measurement Control Technique for Nondestructive Assay of Special Nuclear Materials.
J. F. Lemming. 1979, 3p CONF-790430-10

Contract AC04-76DP00053
Annual symposium on safeguards and nuclear material management, Brussels, Belgium, 25 Apr 1979.

Descriptors: *Nuclear materials management, Accounting, Calibration, Nondestructive analysis, Safeguards.
Identifiers: ERDA/055001.

For abstract, see ERA citation 04:042451.

NEDC-23856 PC **A04**/MF **A01**
General Electric Co., San Jose, CA. Nuclear Energy Engineering Div.
Alternate Water Chemistry Program. Quarterly Report 1, from Program Start to December 31, 1977.
E. L. Burley. Aug 78, 52p
Contract EY-76-C-02-2985

Descriptors: *Bwr type reactors, *Primary coolant circuits, Additives, Ammonia, Coolant cleanup systems, Oxygen, Radiolysis, Removal, Research programs, Water, Water chemistry.
Identifiers: ERDA/210100.

For abstract, see ERA citation 04:040822.

NUREG/CR-0609 PC **A05**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Power-Cooling-Mismatch Test Series, Fuel Rod Material Properties Data Report,
Deborah K. Kerwin, Adrienne H. Novick, and Charles S. Olsen. Aug 79, 96p TREE-1331
Contract DOE-EY-76-C-07-1570

Descriptors: *Nuclear fuel rods, *Nuclear reactor safety, Nuclear reactor accidents, Physical properties, Chemical properties, Mechanical properties, Metallurgical analysis, Nuclear fuel claddings.
Identifiers: *Power-cooling-mismatch accidents, Fuel element failure, Zircaloy 4.

This report presents the physical, chemical, mechanical, and metallurgical properties of the Power-Cooling-Mismatch (PCM) Test Series fuel rod components. These data were obtained from examinations and tests of representative unirradiated fuel rod materials, and are necessary to understand and evaluate both fuel rod behavior during irradiation testing in the PCM Test Series, and the posttest condition of various fuel rod materials.

NUREG/CR-0663 PC **A09**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Safeguards Material Control and Accounting at Licensed Processing Facilities. Quarterly Report, July--September 1977.
I. J. Sacks. Dec 78, 190p UCRL-52703
Contract W-7405-ENG-48

Descriptors: *Fuel reprocessing plants, *Nuclear materials management, Accounting, Nuclear materials diversion, Research programs, Safeguards.
Identifiers: ERDA/055001.

For abstract, see ERA citation 04:042458.

NUREG/CR-0682 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Quarterly Progress Report on Fission Product Behavior in LWRs for the Period October--December 1978.
A. P. Malinauskas, R. A. Lorenz, J. L. Collins, M. F. Osborne, and R. L. Towns. Feb 79, 21p
ORNL/NUREG/TM-308
Contract W-7405-ENG-26

Descriptors: Bwr type reactors, *Fission product release, Fuel element failure, *Loss of coolant, Pwr type reactors, Cesium, Iodine, Krypton, Radioactivity transport, Research programs.
Identifiers: ERDA/220900, ERDA/210200, ERDA/210100, Nuclear reactor accidents, Kryton 86, Cesium 134, Iodine 129.

For abstract, see ERA citation 04:040961.

NUREG/CR-0752 PC **A03**/MF **A01**
Oak Ridge National Lab., TN.
LMFBR Aerosol Release and Transport Program Quarterly Progress Report for October-December 1978,
T. S. Kress, and M. L. Tobias. Aug 79, 47p
ORNL/NUREG/TM-318
Contract W-7405-eng-26
See also NUREG/CR-0340.

Descriptors: *Nuclear reactor accidents, *Nuclear reactor safety, Nuclear reactor containment, Uranium oxides, Bubbles, Liquid metals, Sodium.
Identifiers: *Reactor core disruption, LMFBR type reactors, Uranium dioxide, Radioactive aerosols.

The Aerosol Release and Transport from Liquid-Metal Fast Breeder Reactor (LMFBR) Fuel Program is designed to investigate the release and transport of radionuclides that may result from a hypothetical core-disruptive accident in an LMFBR. The various experiments conducted include four underwater tests of the FAST vaporizer design, two sodium spray fire experiments in secondary containment studies, experiments with the dc plasma metal-oxygen torch, and analytical studies of the heat and mass transfer processes that could occur in a UO2 vapor bubble rising in sodium.

NUREG/CR-0760 PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
SIMMER-II Analysis of the R-7 TREAT Test.
W. R. Bohl. Mar 79, 30p LA-7763-MS
Contract W-7405-ENG-36

Descriptors: *Fttf reactor, Computer calculations, Data analysis, *Loss of flow, Simulation, Treat reactor.
Identifiers: ERDA/220900, ERDA/220600, Nuclear reactor accidents, SIMMER-2 computer program.

For abstract, see ERA citation 04:043023.

NUREG/CR-0855 PC **A08**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Reactor Safety Research Programs.
Quarterly rept. 1 Jan-31 Mar 79,
J. L. Hooper. Aug 79, 170p PNL-3040-1
Contract DOE-EY-76-C-06-1830
See also report dated Jun 79, NUREG/CR-0681.

Descriptors: *Nuclear reactor safety, Heat sinks, Computer programming, Graphite, Nondestructive tests, Pressure vessels, Steam pipes.

This report summarizes work performed in ultimate heat sink performance measurements, steady state code development, graphite nondestructive testing, acoustic emission-flaw relationship for in-service monitoring of nuclear pressure vessels, fuel subassembly procurement and irradiation test program, steam generator tube integrity, core thermal mode development, and integration of nondestructive examination reliability and fracture mechanics.

NUREG/CR-0862 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Startup Data Report for NRC/PNL Halden Assembly IFA-513,
D. D. Lanning, and M. E. Cunningham. Jul 79, 70p PNL-2948
Contract DOE-EY-76-C-06-1830

Descriptors: *Nuclear fuel assemblies, Nuclear fuel rods, Radiation effects, Pressure, Gases, Temperature, Nuclear fuel claddings, Mathematical models.
Identifiers: HBWR reactor, Fuel element failure.

This report presents data from the first month of operation of IFA-513, which is a heavily instrumented 6-rod test assembly in the Halden Reactor in Norway. The assembly is jointly sponsored by the Halden Project and the Nuclear Regulatory Commission (NRC), and is part of a series of irradiation tests sponsored by the NRC to verify its single-rod fuel modeling computer programs. All the rods in the series are of the basic BWR-6 design with variations in gap size, fuel type, fill gas composition, and fill gas pressure. The present assembly, IFA-513, is the third in the series; its 6 rods are all identical, except for variations in fill gas composition and pressure. The measurements made in IFA-513 and the earlier tests include fuel temperature and power (both steady-state and transient), total cladding elongation, and fill gas pressure. The above measurements are made on a continuous basis, providing a record of their variation with both power and burnup.

NUREG/CR-0864 PC **A03**/MF **A01**
Argonne National Lab., IL.
Physics of Reactor Safety.
Quarterly rept. Jan-Mar 79.
Aug 79, 43p ANL-79-37
See also report dated Apr 79, PB-293 348.

Descriptors: *Nuclear reactor safety, Critical assemblies, Reactor cores, Thermal analysis, Hydraulics, Monte Carlo method, Mathematical models.

This Quarterly progress report summarizes work done during the months of January-March 1979 in Argonne National Laboratory's Applied Physics and Components Technology Divisions for the Division of Reactor Safety Research of the U.S. Nuclear Regulatory Commission. The work in the Applied Physics Division includes reports on reactor-safety research and technical coordination of the RSR safety analysis program by members of the Reactor Safety Appraisals Group, Monte Carlo analysis of safety-related critical assembly experiments by members of the Reactor Computations Group, and planning of safety-related critical experiments by members of the Zero Power Reactor (ZPR) Planning and Experiments Group. Work on reactor core thermal-hydraulics was performed in ANL's components Technology Division.

NUREG/CR-0886 PC **A03**/MF **A01**
Creare, Inc., Hanover, NH.
Second Quarter FY 79 Progress Report on Refill Effects Program.
Quarterly progress rept. 1 Jan-31 Mar 79,
C. J. Crowley, and P. H. Rothe. Jul 79, 31p
CREARE-TN-295
Contract NRC-04-75-162

Descriptors: *Nuclear reactor safety, Nuclear reactor accidents, Pressurized water reactors, Fluid flow, Mathematical models, Computer programming.
Identifiers: *Loss of coolant, Transients, RELAP4/MOD5 computer program.

This report describes work on the Creare Refill Effects Program during the second quarter of FY79. Results are summarized according to the various tasks within the program. Particular results of Flashing Transient experiments and the calculation of test results using RELAP4/MOD5 are discussed. Future plans for each of the program topics are also outlined.

NUREG/CR-0901 PC **A06**/MF **A01**
Oak Ridge National Lab., TN.
Criteria for Safety-Related Nuclear Plant Operator Actions: A Preliminary Assessment of Available Data,
P. M. Haas, and T. F. Bott. Aug 79, 109p ORNL/NUREG/TM-330
Contract W-7405-eng-26

Descriptors: *Nuclear reactor safety, *Operators(Personnel), Standards, Reviews, Data acquisition.
Identifiers: Data bases.

An increasing recognition of the profound importance of operator action on nuclear power plant reliability and safety has prompted formulation of ANSI Standard N660. This report reviews the history and content of ANSI Standard N660 and outlines a program for building a data base on operator response to PSAR Chapter 15 events. A preliminary assessment of the availability of field data at nuclear plants, as well as methods for collecting these data, are presented. Augmentation of field data by simulator studies and calibration of the simulator to field data are discussed. Field data collected in a pilot study are presented along with the results of operator opinion surveys. A statistical analysis of data on response time for inadvertent safety injection is included.

NUREG/CR-0952 PC **A05**/MF **A01**
Arizona Univ., Tucson. Dept. of Nuclear Engineering.
A Conceptual Design of a Uranyl Nitrate Fueled Reactor for the Destructive Testing of Liquid Metal Fast Breeder Reactor Fuel Subassemblies.
Thesis Sep 78-Jul 79,
Steven E. Ramsower. Aug 79, 90p

Descriptors: *Nuclear research and test reactors, *Neutron cross sections, Uranyl compounds, Inor-

ganic nitrates, Nuclear fuel assemblies, Reactor cores, Computer programming, Design, Mathematical models.
Identifiers: Uranyl nitrates, LMFBR type reactors, AMPX system.

A preliminary design of a uranyl nitrate test reactor is developed, with emphasis placed on the core neutronics and cross section development. ENDF/-IV cross section data and the AMPX system were used to develop a 25 group neutron cross section library. A series of one-dimensional transport calculations were made in order to arrive at a reference design. Power densities of 16.5 kW/l appear to be attainable in the 217 pin FFTF test subassembly, with a peak neutron flux in the test zone of 2.4 times 10 to the 14th power n/sq cm-sec. Other engineering features pertinent to the overall system design are discussed, including corrosion, treatment of radiolytic gas, heat removal, and reactor control.

NUREG-0452-REV-2 PC **A23**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Div. of Operating Reactors.
Standard Technical Specifications for Westinghouse Pressurized Water Reactors, Revision of July 1979.
Technical rept.,
P. C. Wagner. Jul 79, 550p
Supersedes PB-283 189.

Descriptors: *Nuclear reactor safety, *Pressurized water reactors, Standards, Cooling systems, Control equipment, Nuclear reactor containment.
Identifiers: *Westinghouse standard reactors, Reactor licensing, Reactor control systems.

The Standard Technical Specifications for Westinghouse Pressurized Water Reactors (W-STS) is a generic document prepared by the USNRC for use in the licensing process of current Westinghouse pressurized water reactors. The W-STS sets forth the limits, operating conditions and other requirements applicable to nuclear reactor facility operation as set forth in by Section 50.36 of 10 CFR Part 50 for the protection of the health and safety of the public. This document is revised periodically to reflect current licensing requirements.

NUREG-0573 PC **A07**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Div. of Reactor Safety Research.
Analysis of ECC Bypass Data.
Technical rept.,
W. D. Beckner, J. N. Reyes, Jr., and R. Anderson. Jul 79, 136p

Descriptors: *Nuclear reactor safety, Pressurized water reactors, Scale effect, Model tests.
Identifiers: *ECCS, Loss of coolant.

Data from small scale tests investigating the delivery of emergency core cooling water into the lower plenum of a pressurized water reactor have been analyzed. A statistical analysis of data trends has been performed and the data represented in correlational form. The effects of test pressure are well understood and all pressure effects observed are accounted for by steam properties. Uncertainty exists concerning how to extrapolate these small scale test results to full scale. However, small scale tests indicate that a constant momentum flux scaling of the hydraulics may be more appropriate than the traditional J* scaling. Evidence also exists which suggests that condensation effects may be increasing in importance as scale size increases.

NUREG-0582 PC **A05**/MF **A01**
Nuclear Regulatory Commission, Washington, DC. Div. of Systems Safety.
Water Hammer in Nuclear Power Plants.
Technical rept.
Jul 79, 90p

Descriptors: *Nuclear power plants, *Water hammer, Piping systems, Dynamic loads, Cavitation, Unsteady flow, Two phase flow, Cooling systems.
Identifiers: Light water reactors.

The staff reviewed information on water hammer events obtained primarily from Licensee Event Reports and information requests to licensees. Approximately 30 fluid systems in each of four light water reactor designs were also reviewed to determine the potential for significant water hammer events. Water hammer, as used in this report, was generalized in meaning to include transients involving steam flow (steam hammer) and two-phase flow (e.g., water entrainment in steam lines, steam bubble collapse) in addition to the classical water hammer transients such as those involving valve closing and pump startup in solid water systems. Discussions of nine different types of water hammer problems, involving ten plant systems, are presented. Completed or scheduled staff actions and staff recommendations concerning water hammer problems are summarized.

N79-28484/0GA PC **A18**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Two-Phase Flows in Nuclear Reactors, Volume 1.
1978, 403p VKI-LEC-SER-1978-5-V-1
Seri-2. Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 17-21 Apr. 1978.

Descriptors: Light water breeder reactors, Liquid metal fast breeder reactors, *Two phase flow, Boiling, Critical flow, Flow characteristics, Heat transfer, Hydrodynamic equations, Mathematical models, Nucleation, Pressure distribution, Reactor ssafety.
Identifiers: *Nuclear reactors, *Meetings.

For abstract, see STAR 1719

N79-28497/2GA PC **A17**/MF**A01**E
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Two-Phase Flows in Nuclear Reactors.
1978, 394p VKI-LEC-SER-1978-5-V-2
Seri-2. Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 17-21 Apr., 1978.

Descriptors: Conferences, Liquid cooled reactors, Performance prediction, Pressure gradients, *Two phase flow, Critical flow, Flow stability, Friction factor, Nucleation, Reactor safety, Transition points.
Identifiers: *Nuclear reactors, *Meetings.

For abstract, see STAR 1719

N79-28575/5GA PC **A09**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Pumps for Nuclear Applications.
1978, 181p VKI-LEC-SER-1978-3-V-2
Seri-2. Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 9-10 Mar. 1978.

Descriptors: *Conferences, *Design analysis, *Mechanical engineering, *Nuclear reactors, *Pumps, Centrifugal pumps, Fail-safe systems, Fluidics, Performance tests, Transient heating, Water cooled reactors.
Identifiers: *Meetings.

For abstract, see STAR 1719

ORNL/TM-6504 PC **A04**/MF **A01**
Oak Ridge National Lab., TN.
Research and Development Requirements for the Recycle of Bred Fuels in Uranium and Thorium Fuel Cells.
P. R. Kasten, R. G. Wymer, W. D. Burch, B. L. Vondra, and A. L. Lotts. May 79, 55p
Contract W-7405-ENG-26

Descriptors: *Fuel cycle, *Plutonium recycle, Power reactors, Thorium cycle, Economics.
Identifiers: ERDA/210802.

For abstract, see ERA citation 04:044798.

PNL-2923 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
COBRA-IV Comparison with the WARD 11:1 Scale LMFBR Air Flow Tests.
K. L. Basehore, and T. L. George. Mar 79, 61p
Contract EY-76-C-06-1830

Descriptors: *Fuel assemblies, *Lmfbr type reactors, Computer calculations, Hydraulics, Mathematical models, Performance testing, Simulation.
Identifiers: ERDA/210500, Air flow, COBRA-4 computer program.

For abstract, see ERA citation 04:044771.

SAND-78-2145 PC **A04**/MF **A01**
Sandia Labs., Albuquerque, NM.
Two-Region Core Design Concepts for the Upgrade of the Annular Core Pulse Reactor.
P. S. Pickard, and J. P. Odom. May 79, 61p
Contract EY-76-C-04-0789

Descriptors: *ACPR reactor, Design, Modifications, *Reactor cores, Reactor kinetics.
Identifiers: ERDA/220600.

For abstract, see ERA citation 04:044828.

SAND-79-0257 PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Evaluation of the RACON 15000 Microwave Motion Detection System.
Jan 79, 22p
Contract EY-76-C-04-0789

Descriptors: *Motion detection systems, Evaluation, Nuclear materials diversion, Safeguards.
Identifiers: ERDA/055001, RACON 15000 system, Microwave equipment.

For abstract, see ERA citation 04:044408.

SAND-79-0258 PC **A03**/MF **A01**
Sandia Labs., Albuquerque, NM.
Evaluation of the Peak MA-6600L Microwave Motion Detection System.
Feb 79, 42p
Contract EY-76-C-04-0789

Descriptors: *Motion detection systems, Evaluation, Nuclear materials diversion, Safeguards.
Identifiers: ERDA/055001, MA-6600L system, Microwave equipment.

For abstract, see ERA citation 04:044409.

UCID-18117 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Effects of Torus Wall Flexibility on Forces in the Mark I BWR Pressure Suppression System: Extended Analyses under SRV T-Quencher Loading.
G. S. Holman, and S. C. H. Lu. 11 Apr 79, 26p
Contract W-7405-ENG-48

Descriptors: *BWR type reactors, *Containment shells, Configuration, Pressure gradients, Pressure suppression, Stress analysis.
Identifiers: ERDA/210100, Nuclear reactor safety.

For abstract, see ERA citation 04:044749.

WAPD-TM-1316 PC **A07**/MF **A01**
Bettis Atomic Power Lab., West Mifflin, PA.
ASBLT: A System of DATATRAN Modules Which Process Core Fuel Loading for Use in as-Built Calculations (LWBR Development Program).
B. R. Beaudoin, W. J. Beggs, C. R. Case, and R. Wilczynski. Feb 79, 131p
Contract EY-76-C-11-0014

Descriptors: Computer codes, Fuel management, *Lwbr type reactors, *Reactor fueling, A codes, Data processing, Design, Fabrication, Fuel cycle, Fuel pellets, Fuel rods, Reactor cores, Thorium oxides, Uranium dioxide.
Identifiers: ERDA/210500, *ASBLT computer program.

For abstract, see ERA citation 04:042929.

18J. Reactor Materials

ANL-79-11 PC **A02**/MF **A01**
Argonne National Lab., IL.
Status and Development Potential of Plate-Type Fuels for Research and Test Reactors.
D. Stahl. Mar 79, 25p
Contract W-31-109-ENG-48

Descriptors: *Fuel plates, Research reactors, Test reactors, Design, Highly enriched uranium.
Identifiers: ERDA/220600.

For abstract, see ERA citation 04:044817.

BNL-25812 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.

Performance of Ceramic Materials in High Temperature Steam and Hydrogen.
F. L. Horn, J. A. Fillo, and J. R. Powell. 1979, 5p
CONF-790125-56
Contract EY-76-C-02-0016
Topical meeting on fusion reactor materials, Miami Beach, FL, USA, 29 Jan 1979.

Descriptors: *Aluminium oxides, *Breeding blankets, *Magnesium, *Silicon carbides, *Zirconium oxides, Carbon dioxide, Hydrogen, Materials testing, Performance, Production, Steam, Synthetic fuels, Very high temperature.
Identifiers: ERDA/700209, ERDA/360204.

For abstract, see ERA citation 04:044153.

GA-A-15145 PC **A05**/MF **A01**
General Atomic Co., San Diego, CA.
Reprocessing Flowsheet and Material Balance for MEU Spent Fuel.
L. Abraham. Oct 78, 90p
Contract EY-76-C-03-0167-053

Descriptors: *Head end processes, *Off-gas systems, *Spent fuels, *Thorex process, Flowsheets, Htgr type reactors, Material balance, Moderately enriched uranium, Reprocessing, Thorium oxides.
Identifiers: ERDA/050800, Process charting.

For abstract, see ERA citation 04:025610.

GA-A-15224 PC **A03**/MF **A01**
General Atomic Co., San Diego, CA.
Iodine and Ruthenium Volatility in Thorium Fuel Reprocessing. Interim Development Report.
R. G. Wilbourn. Jan 79, 34p
Contract EY-76-C-03-0167-053

Descriptors: *Htgr type reactors, *Iodine, *Ruthenium, *Thorex process, *Thorium oxides, Dissolution, Gaseous wastes, Off-gas systems, Radioactive wastes, Reprocessing, Thorium cycle, Volatility.
Identifiers: ERDA/050800, ERDA/052000.

For abstract, see ERA citation 04:042383.

LTR-141-101 PC **A04**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Long-Term Bearing Wear Tests of Conventional Journal Bearings and Development of Hydrostatic Bearings for the LOFT Drag-Disc Turbine Transducer.
J. R. Fincke. 22 Mar 79, 59p
Contract EY-76-C-07-1570

Descriptors: *Loft reactor, Bearings, Corrosion, Flowmeters, Performance testing, Pwr type reactors, Reactor materials, Test facilities, Water chemistry.
Identifiers: ERDA/220600, ERDA/210200, Journal bearings.

For abstract, see ERA citation 04:042981.

NUREG/CR-0330 PC **A10**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Ex-Reactor Determination of Thermal Gap and Contact Conductance between Uranium Dioxide: Zircaloy-4 Interfaces. Stage I: Low Gas Pressure.
John E. Garnier, and Stefan Begej. Aug 79, 218p
PNL-2696
Contract DOE-EY-76-C-06-1830

Descriptors: *Uranium oxides, *Zircaloys, *Nuclear fuel assemblies, Interfaces, Heat transfer, Thermal conductivity, Computer programs, Nuclear fuel claddings, Nuclear fuel elements, Gas dynamics, Fortran.
Identifiers: Zirconium alloy Zircaloy 4, Flash computer program.

A study of thermal gap and contact conductance between depleted uranium dioxide (UO2) and Zircaloy-4 (Zr4) has been made using two measurement apparatuses developed as part of this program. Both gap and contact conductance experiments were performed using the MPD (Modified Pulse Design) and MLD (Modified Longitudinal Design) techniques as a function of temperature, gas composition average mean-plane separation distances, contact pressure and surface morphology at atmospheric pressure: It was seen that H sub g is dependent on all these variables. A review of heat transfer formulations appropriate to estimation of gaseous conduction in the continuum and free molecular regime of gas dynamic is made. Comparison of MLD contact conductance (H sub C) results with those reported by the investigator Ross and Stoute, Dean, and Rapier is made. A review of models for predicting solid: solid thermal contact conductance based on surface roughness and elastic/plastic deformation of asperities and on surface waviness and elastic deformation is made.

WCAP-9359 PC **A04**/MF **A01**
Westinghouse Electric Corp., Pittsburgh, PA. Nuclear Fuel Div.
Research and Development Program for Selected Components of Mixed Oxide Fuel Fabrication. Quarterly Progress Report for Period Ending March 31, 1978.
J. C. Limpert. 1978, 60p
Contract EN-77-C-06-1058-001

Descriptors: *Mixed oxide fuel fabrication plants, Design, Fuel cycle, Plutonium dioxide, Pneumatic transport, Powders, Research programs, Seals, Uranium dioxide.
Identifiers: ERDA/050700.

For abstract, see ERA citation 04:040362.

18K. Reactor Physics

PNL-2917 PC **A04**/MF **A01**
Battelle Pacific Northwest Labs., Richland, WA.
Sources of Neutronics Data Involving Thorium or exp 233 U and Light Water Moderation.
L. C. Davenport. Nov 78, 56p
Contract EY-76-C-06-1830

Descriptors: *Thorium oxides, *Uranium 233, *Water moderated reactors, Criticality, Data, *Nuclear data collections, Reactor kinetics, Uranium dioxide.
Identifiers: ERDA/220100.

For abstract, see ERA citation 04:044802.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-A070 526/9GA PC **A08**/MF **A01**
Defense Nuclear Agency Washington DC
MISERS BLUFF. Preliminary Results Report. Volume I. Phase I.
Final project officers rept.,
Robert G. DeRaad. 22 Jan 79, 164p DNA-POR-6980-VOL-1, DOE-WT-6980-VOL-1

Descriptors: *High explosives, *Cratering, *Airburst, *Ground motion, *Launching sites, Hardened structures, Guided missile launchers, Weapon systems, Survival(General), Antimissile defense systems, Multibursts, Field tests, Management planning and control.
Identifiers: MISERS BLUFF project.

This report describes the preliminary results obtained from Phase I of the MISERS BLUFF Field Test Program. Phase I consisted of a series of eight high explosive tests conducted on the White Sands Missile Range, New Mexico in 1977. The primary purpose of these events was to develop a multiple burst ground motion data base. Included in this report are a description of the experimental plan for each test and typical ground motion, airblast and cratering results for each test. (Author)

AD-A070 532/7GA PC **A03**/MF **A01**
Army Armament Research and Development Command Aberdeen Proving Ground MD Ballistics Research Lab
Design of a Low L/D Deep Earth Penetrator.
Final rept.,
A. J. Ricchiazzi, E. T. Roecker, and C. J. Brown. Mar 79, 50p ARBRL-MR-02912, AD-E430 249

Descriptors: *Earth penetrating devices, *Projectiles, Taper, Ballistic trajectories, Yaw, Sabot projectiles, Tool steel, Penetration, Concrete, Clay, Surface targets, Deep depth, Terminal ballistics, Cylindrical bodies, Length, Diameters, Ratios, Impact, Velocity, Tactical weapons, Nuclear weapons, Test and evaluation.

Steel cylindrical and tapered projectiles weighing 425 grams and having a L/D ratio of 5 were fired against concrete/clay targets at striking velocities of 305 and 610 m/s. It was found that low L/D projectiles with tapered bodies appear to be a feasible solution for systems requiring predictable deep earth penetrators. It appears that minimum body taper required for stability probably increases with increasing striking velocity. Path deviation seems to decrease with increasing striking velocity. Results ofthe tests indicate that the delay of onset of rapid yaw ans swerve growth is increased as striking yaw is decreased, which is especially true for projectiles with very small yaws. The tapered projectile concept offers promise as an earth penetrator for both tactical nuclear and conventional weapon systems. (Author)

AD-A070 561/6GA MF **A01**
Naval Ammunition Production Engineering Center Crane IN
Automatic Mix-Melt Production Process Development for Tritonal, H-6, and Minol II, A Project of the Manufacturing Technology Program, Naval Sea Systems Command.
Final rept.,
Gale A. Groh. 15 May 78, 204p
Availability: Microfiche copies only.

Descriptors: *Tritonal explosives, *Manufacturing, *Automation, *Explosives, TNT, Ammonium nitrate, Aluminized explosives, RDX, Mixing, Melting, Computer programs, Subroutines.
Identifiers: H-6 explosive, Minol-2 explosive, Composition B explosive, Computer aided manufacturing.

The results of a successfully completed NAVSEA sponsored Manufacturing Technology project are reported. The project was carried out by the Naval Ammunition Production Engineering Center (NAPEC), NAVAMPROENGCEN Crane, Indiana in connection with the modernization of the bomb loading production facility at McAlester AAP (formerly NAD McAlester). The program objectives including identification of the parameters governing the mixing process for explosive loads and the development of a full-scale automated equipment system necessary to demonstrate the new technology in the mixing of tritonal were accomplished. The new process provides a more uniform product, increased safety and economic benefits. (Author)

AD-A070 591/3GA PC **A03**/MF **A01**
Army Armament Research and Development Command Aberdeen Proving Ground MD Ballistics Research Lab
Measurement of Sabot Discard and Analysis of Associated Launch Disturbances.
Final rept.,
Edward M. Schmidt. Apr 79, 33p ARBRL-TR-02157, AD-E430 248

Descriptors: *Sabot projectiles, Fin stabilized ammunition, Launching, Perturbations, Kinetic energy projectiles, Projectile trajectories, Roll, Blast, Gun muzzles, Aeroballistics, Aerodynamic forces, Interference, Fins, Yaw, Exterior ballistics, Ballistic trajectories, Free flight, Dispersing.
Identifiers: *Discarding sabots, Muzzle blast.

The sabot discard process from a slowly rolling, fin stabilized projectile is examined from the time of shot ejection until the round enters interference-free flight. Launch disturbances relating to muzzle blast, fin, shadowing, mechanical contact, and aerodynamic interference are examined both from the experimental data and analytically. (Author)

AD-A070 645/7GA PC **A03**/MF **A01**
Naval Surface Weapons Center White Oak Lab Silver Spring MD
Deflagration to Detonation Transition Behavior of Aluminized HMX,
Donna Price, and A. R. Clairmont, Jr. 4 Jun 79, 43p Rept no. NSWC/WOL/TR-79-119

Descriptors: *HMX, *Aluminized explosives, Deflagration, Detonations, Combustion, Flame propagation, Sensitivity.

The effect of fine (5 microns) and coarse (95 microns) Al on the deflagration-to-detonation (DDT)

behavior of HMX, is charges pressed to 90% theoretical maximum density (TMD), was studied. It was found that Al slows down the DDT process increasingly as the content of Al increases; that is, it increases predetonation column length and the relative times to detonation. Fine Al is more effective than coarse in delaying DDT, at a given content , but both are inferior to wax in this respect. (Author)

AD-A070 824/8GA PC **A05**/MF **A01**
BEI Electronics Inc Little Rock AR
Study and Evaluation of Several Smoke-Generating Materials for Use in Hazard-Free Cartridges for 81-mm Mortar Inert Training Ammunition.
Final rept.,
Alcuin F. Gremillion, and Daniel A. Lieblong. 15 Jan 79, 79p
Contract DAAK10-78-C-0077
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: *Smoke munitions, *Mortar ammunition, *Training ammunition, *Cartridges, Safety, Hazards, Toxicity, Burning rate, Low rate, Pyrotechnics, Mixtures, Photographs.
Identifiers: 81-MM Mortar ammunition.

Seven smoke-producing systems were used in the laboratory to produce smokes or dusts under conditions which would enable comparison of the products from the standpoint of quality and quantity of smoke and ease of production. The major portion of the data is presented in the form of photographs. Three of the systems studied are recommended as candidates for field tests in 81-mm mortar training rounds. The two that are most preferred are chemical mixtures that produce /smoke spontaneously and instantly when the components are brought together. The third is a slow-burning mixture. An assessment of toxic hazards from the chemicals used is included. (Author)

AD-A070 896/6GA PC **A04**/MF **A01**
EMTEC Engineering Inc Berkeley CA
Scattering by Buried Finite Cylindrical Dielectric Land Mines.
Final rept.,
Shu-Kong Chang. 20 Mar 79, 52p
Contract DAAK70-78-C-0168

Descriptors: *Land mines, *Mine detection, *Mine clearance, *Electromagnetic scattering, Finite element analysis, Maxwells equations, Dielectric properties, Mathematical models.

The unimoment method is applied to solve the electromagnetic scattering by a buried dielectric finite cylinder simulating a land mine. The computational results are reported at 700 MHz, 800 MHz, 900 MHz, and 1000 MHz. The fields are presented in graphical form including parametric studies. The results will greatly enhance the ability of engineers in designing and improving effective land mine detection systems. (Author)

AD-A070 918/8GA PC **A05**/MF **A01**
Naval Weapons Center China Lake CA
ESKIMO V Magazine Separation Test.
Test rept. for period ending Aug 77,
Frederick H. Weals, and Bill Finder. Feb 79, 81p
Rept no. NWC-TP-6076

Descriptors: *Magazines(Ordnance), *Detonations, *Arches, TNT, Safety, Concrete, Beams(Structural), Structural response, Explosion effects, Hazards, Separation, Range(Distance), Storage, Subsurface, Soils.
Identifiers: Eskimo-5 project, Igloo structures, *Quantity distance storage.

In an instrumented test conducted in August 1977 at the Naval Weapons Center, approximately 75,000 pounds (34, 000 kilograms) of trinitrotoluene (TNT) explosives were detonated. The explosives were contained in a hemisphere built of 9,376, 8-pound (3.6-kilogram) demolition blocks, and were detonated by means of an initiation system located at the center of the hemisphere. Principal objectives of the test were to justify removal of concrete thrust beams from an oval steel-arch igloo and to demonstrate the safety of applying current side-to-side separation distances to concrete-arch igloos which have never been tested at those distances. Additionally, the test demonstrated the greater safety of earth-covered storage as opposed to above-ground storage. (Author)

AD-A071 177/0GA PC **A04**/MF **A01**
Harry Diamond Labs Adelphi MD
A Fuze Function Setter--Baseline Design.
Technical rept.,
Telemachos J. Manolatos. Mar 79, 53p Rept no. HDL-TR-1848

Descriptors: *Fuze setters, Projectile fuzes, Guided projectiles, Time delay fuzes, Magnetic induction, Data links, Amplitude modulation, Metal nitride oxide semiconductors, Integrated circuits, Prototypes, Laser guidance, Semiactive guidance.
Identifiers: Design, Inductive links, Verification.

The fuze function setter system described provides a means for inductively transmitting data and energy into an unpowered projectile prior to firing. This system was developed because of a need to program the Navy's Semi-Active Laser Guided Projectile with time delay and guidance information as it is loaded into the gun. An advanced development prototype system is described that demonstrates the feasibility of this type of design. Both the setter and the projectile electronics were fabricated and tested. The system features a reverse link whereby the round retransmits the data that it receives for verification. It also incorporates a metal nitride oxide semiconductor memory for long-term storage and a custom integrated circuit for minimum volume and power requirements. The system was successfully demonstrated in the field and will proceed to the engineering development phase. (Author)

AD-A071 198/6GA PC **A03**/MF **A01**
Army Materiel Systems Analysis Activity Aberdeen Proving Ground MD
Cartridge 81mm, HE, M374 Quality Readiness Review.
Technical rept.,
Rodney J. Russell. Mar 79, 42p Rept no. AMSAA-TR-247

Descriptors: *Mortar ammunition, *Acceptance tests, *Cartridges, Inspection, Quality assurance, Specifications, Test and evaluation, High explosive ammunition, Mortar fuzes, Ammunition components, Defects(Materials), Ammunition.
Identifiers: Mortars(81-mm), M-374 projectiles(81-mm).

This report presents the results of a review and analysis of acceptance and quality assurance procedures used for the 81mm mortar round: HE, M374. Objective evaluation was performed where quantitative goals of the procedures are stated in the specifications; otherwise, assumptions were made and stated as to the intended goals of procedures and are so evaluated. Cost effectiveness of the procedures is also evaluated where possible. (Author)

MHSMP-79-26 PC **A02**/MF **A01**
Mason and Hanger-Silas Mason Co., Inc., Amarillo, TX.
Investigation of the Effect of Granule Size on the Mechanical Properties of LX-14.
H. D. Johnson. Apr 79, 13p
Contract EY-76-C-04-0487

Descriptors: *Chemical explosives, Creep, Diagrams, Experimental data, Grain size, Tables, Tensile properties.
Identifiers: ERDA/450100, LX-14 explosives.

For abstract, see ERA citation 04:045308.

NP-tr-23781 PC **A02**/MF **A01**
Heat Sensitivity Tests.
T. Yoshida, M. Tamura, and M. Itoh. 1978, 24p
A, Kogyo Kayaku, 39 n3 P106 1978.
U.S. Sales Only.

Descriptors: *Chemical explosives, *Detonations, Safety, Sensitivity, Stability, Temperature effects.
Identifiers: ERDA/450100, Translations, Japan.

For abstract, see ERA citation 04:043712.

SAND-78-8784 PC **A03**/MF **A01**
Sandia Labs., Livermore, CA.
Variable Explosive Chamber Test Results.
R. Ng. Jun 79, 31p
Contract EY-76-C-04-0789

Descriptors: *Actuators, *Chemical explosives, Design, Equations of state, Performance testing, Pressure measurement, Test facilities.
Identifiers: ERDA/450100, ERDA/420200.

For abstract, see ERA citation 04:045309.

SAND-79-0721 PC **A04**/MF **A01**
Sandia Labs., Albuquerque, NM.
Method for Describing Nearly Normal Penetration of an Ogive Nosed Penetrator into Terrestrial Targets.
N. T. Davie. Jun 79, 63p
Contract EY-76-C-04-0789

Descriptors: *Earth penetrators, Analytical solution, Forecasting, Graphs, Performance, Stress analysis, Tables, Theoretical data.
Identifiers: ERDA/420200, *Projectiles.

For abstract, see ERA citation 04:045204.

UCID-16077-79-3 PC **A05**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Hard Structure Munition Project. HSM Progress Report No. 83, 1–31 March 1979.
F. E. Walker. 10 Apr 79, 91p
Contract W-7405-ENG-48

Descriptors: *Ordnance, *Chemical explosives, Design, Research programs, Weapons.
Identifiers: ERDA/420200, ERDA/450100.

For abstract, see ERA citation 04:043586.

19C. Combat Vehicles

AD-A070 619/2GA PC **A05**/MF **A01**
Logistics Management Inst Washington DC
Combat and Tactical Vehicle Maintenance in the Army,
Eugene A. Narragon, Jerome M. Neil, and Joseph R. Wilk. Jun 79, 99p
Contract MDA903-77-C-0370

Descriptors: *Combat vehicles, Maintenance, Repair, Maintenance Personnel, Proficiency, Army training, Combat readiness, Operational readiness, Military requirements, Logistics support, Maintenance management, Manpower utilization, Military force levels.

This study reviews the capability of direct and general support maintenance units to satisfy wartime requirements. Units assigned to the Forces Command, Europe, Army Reserve, and the Army National Guard were included in the evaluation. Active Army DS units are generally capable of performing at their planned wartime level. Several nondivisional units are not receiving the necessary experience on some equipment. It is recommended that the Army realign maintenance support missions so that those units maintain equipment they will support during wartime. Active Army GS units are unprepared for wartime. Many units are not performing GS-level repairs, those that do concentrate on easier, tactical vehicle components. Few units receive any exposure to end items, especially combat vehicles. It is recommended that the Army establish a Mechanic Enhancement Program for GS-level mechanics. That program integrates apprentice training, improved workload and missions for active units, and advanced technician training for experienced GS mechanics.

AD-A071 068/1GA PC **A03**/MF **A01**
Army Materiel Systems Analysis Activity Aberdeen Proving Ground MD
A Comparison of Maintenance Costs and RAM Characteristics of New and Overhauled M35A2 2-1/2 Ton Trucks.
Technical rept.,
Raymond Bell, Robert Mioduski, and Edward Belbot. Jan 79, 48p Rept no. AMSAA-TR-251

Descriptors: *Trucks, *Maintenance, Cost analysis, Performance(Engineering), Reliability, Maintainability, Comparison, Statistical analysis, Replacement.
Identifiers: M-35 trucks, M-35A2 trucks, 2-1/2-Ton trucks, Availability, Overhauled trucks.

Group 19C—Combat Vehicles

A comparison of the maintenance costs, and reliability, availability and maintainability (RAM) characteristics of new and overhauled 2-1/2 ton trucks is presented. This comparison was based on the performance of 259 new and 252 overhauled M35A2 2-1/2 ton trucks operated by the 9th Infantry Division, Ft. Lewis, Washington, over a four year period. The 511 vehicles evaluated in this study accumulated a total of 2.7 million miles with the individual new and overhauled vehicles accumulating mileage histories up to 19,000 and 11,000 miles, respectively. (Author)

19D. Explosions, Ballistics, and Armor

AD-A070 734/9GA PC **A02**/MF **A01**
Army Armament Research and Development Command Dover NJ Large Caliber Weapon Systems Lab
Dynamic Modeling of Post Failure Conditions of Reinforced Concrete Subjected to Blast.
Memorandum rept.,
Michael F. Leondi. Mar 79, 18p ARLCD-MR-78007, AD-E400 305

Descriptors: *Blast loads, *Reinforced concrete, Safety, Munitions industry, Dynamic response, Failure(Mechanics), Mathematical models, Fragmentation, Overpressure, Velocity, Mechanical properties, Explosion effects, Experimental design, Fragments, Secondary, Scale models.
Identifiers: Geometric properties, Ammunition plants.

A dynamic modeling analysis of post-failure fragments of reinforced concrete subjected to blast overpressures was performed. The analysis related the physical (constitutive) properties as well as the geometric relationships of the model and the prototype. Results indicated that a replica model can provide rational test data if all the mechanical and geometric properties of the reinforced concrete element are reflected in the model.

AD-A071 156/4GA PC **A03**/MF **A01**
Naval Surface Weapons Center White Oak Lab Silver Spring MD
Development of Random Choice Numerical Methods for Blast Wave Problems,
Harland M. Glaz. 7 Mar 79, 45p Rept no. NSWC/WOL/TR-78-211

Descriptors: *Blast waves, Numerical methods and procedures, Wave propagation, Conservation, Mathematical models, Random variables, Shock waves, Interfaces.
Identifiers: Hyperbolic systems, Conservation laws, Riemann problem, Glimms method.

Glimm's method (AD-633 551) is a relatively new numerical technique for solving hyperbolic systems of conservation laws, including those describing compressible fluid mechanics. This report contains an outline of the method, a discussion of the published numerical tests of the method, and some new numerical test results. The latter are one-dimensional models of the effects seen in blast wave propagation. The application of Glimm's method to explosion problems is studied. An appendix is included to indicate how the method can be applied to problems involving a nonideal equation of state. (Author)

19E. Fire Control and Bombing Systems

AD-A070 758/8GA PC **A05**/MF **A01**
Army Test and Evaluation Command Aberdeen Proving Ground MD
Army Aircraft Fire Control Systems Performance Evaluation.
Final rept. on test operations procedure.
1 Jun 79, 79p Rept no. TOP-7-1-006

Descriptors: *Fire control systems, *Army aircraft, Test and evaluation, Airborne, Accuracy, Ballistics, Helicopters, Aircraft guns, Aircraft rockets, Performance(Engineering).
Identifiers: Test operations procedures.

This TOP provides an overview of the testing required for evaluation of the performance or effectiveness of modern Army aircraft weapon systems. A chart of test inputs to an aircraft armament system effectiveness evaluation is provided. Test and analysis procedures for accuracy and dispersion inputs are presented in detail. (Author)

19F. Guns

AD-A070 633/3GA PC **A07**/MF **A01**
Institute for Acoustical Research Miami FL
Seismic Localization of Hostile Artillery.
Final rept.,
D. C. Fletcher, Xavier Zabalgogeazcoa, and James Dorman. Jul 78, 137p Rept no. IAR-78002
Contract N00014-77-C-0446

Descriptors: *Artillery, *Seismic detection, Howitzers, Seismometers, Arrays, Signal processing, Mathematical filters, Transformations(Mathematics).
Identifiers: Hostile artillery location, Haar transform.

This report comprises the final statement regarding some initial exploratory research done by the Institute for Acoustical Research (IAR) on the Hostile Artillery Location (HAL) project. The objective of this research was to re-examine experimental data collected by Honeywell, Inc. and the Environmental Research Institute of Michigan (ERIM) during December 1975. The data collected comprised a series of digital tapes recording the response of a seismometer array to the firing of various howitzers at various ranges. IAR's analysis of this data, though not considered technically complete, nevertheless is considered very successful at least with respect to bearing estimates at 5 km. The composite IAR estimate on three firings is within a few hundredths degree of true and the standard deviation is 1 1/2 degrees. Range estimates can be improved with a larger array and a more sophisticated second stage. (Author)

20. PHYSICS

20A. Acoustics

AD-A070 630/9GA PC **A02**/MF **A01**
American Univ Washington DC
Rough Surface Acoustic Scattering and Scattering of Acoustic Waves from Rough Surfaces.
Final rept.,
Susan K. Numrich, and Earl Callen. 2 Apr 79, 21p
Contract N00014-77-C-0142

Descriptors: *Acoustic scattering, Underwater acoustics, *Surface roughness, Mathematical models, Acoustic measurement, Transducers, Schlieren photography, Computerized simulation, Acoustic fields, Underice.

Measurements have been made of sound scattered in the specular direction by fixed rough surfaces. The surfaces used were physical realizations of computer generated topographies which corresponded to Gaussian distributions in height to within specified limits. Measurements were made in water using 0.5-, 1.0-, and 2.25-MHz transducers. Transient pulse analysis techniques were used to provide information about the scattered pulse over a wide range of frequencies. Comparisons are made with several theoretical models including a multiple scattering model. The scattered field is also illustrated by means of Schlieren visualization. (Author)

AD-A070 651/5GA Not available NTIS
Stanford Univ CA Edward L Ginzton Lab
Phase Imaging in Reflection with the Acoustic Microscope,
A. Atalar, C. F. Quate, and H. K. Wickramasinghe. 22 Aug 77, 3p Rept no. GL-2735
Availability: Pub. in Applied Physics Letters, v31 n12 p791-793, 15 Dec 77. (No copies furnished by DDC.)

Descriptors: *Acoustic beams, *Microscopes, Single crystals, Convergence, Reflection, Elastic properties, Reprints.

No abstract available.

AD-A070 725/7GA PC **A02**/MF **A01**
Stanford Univ CA Edward L Ginzton Lab
Highly Efficient Transducer Arrays Useful in Nondestructive Testing Applications,
C. S. DeSilets, A. R. Selfridge, and G. S. Kino. Sep 78, 7p Rept no. GL-2866
Contract N00014-75-C-0632

Descriptors: Ultrasonic radiation, *Piezoelectric transducers, Nondestructive testing, Arrays, Coupling(Interaction), Energy transfer, Image processing, Sampling, Ceramic materials, Acoustic impedance, Symposia.

The development of two types of transducer arrays for use in a synthetic aperture digital acoustic imaging system is described in this paper. One type of array using narrow slotted piezoelectric elements is most suitable when the acoustic impedance of the load medium is low with respect to that of the piezoelectric ceramic. A second type of array of monolithic construction is useful when the acoustic impedance of the load medium is similar to that of the ceramic, as would be useful for a contracting transducer for nondestructive testing of metals and ceramics.

AD-A070 954/3GA PC **A05**/MF **A01**
Texas Univ at Austin Applied Research Labs
A Summary of the Results of a Study of Acoustic Interaction with the Sea Floor.
Annual rept. 1 Jan-31 Dec 78,
Kenneth E. Hawker, Steven R. Rutherford, and Paul J. Vidmar. 5 Mar 79, 82p Rept no. ARL-TR-79-2
Contract N00014-78-C-0113

Descriptors: *Underwater sound, *Ocean bottom, Range(Distance), Roughness, Sediments, Stiffness, Multipath transmission, Bottom loss, Bottom bounce, Sound transmission, Sensitivity.

This report summarizes the results of research carried out during 1978 on acoustics interaction with the sea floor. Major topics considered are propagation in a range variable environment by mode-mode coupling methods, bottom roughness (scattering) studies, and a number of sensitivity studies including the acoustical effects of sediment rigidity, Doppler broadening due to source motion, and the relationship between mode attenuation and bottom loss per bounce.

AD-A071 188/7GA PC **A02**/MF **A01**
Control Data Corp Melville NY TRG Div
Two Arrays on a Wedge,
V. Mangulis, and J. Gobins. Jun 66, 19p Rept no. TRG-023-TM-66-28
Contract NObsr-93023

Descriptors: *Sonar arrays, *Radiation patterns, Phased arrays, Far field, Beam forming, Wedges.
Identifiers: MOST project-2.

The far field radiation pattern for a phased array on a rigid corner or wedge of corner angle psi $>$ 180 deg. has been calculated before. We will now consider two arrays, one on each side of the wedge, phased to the same direction in the far field.

20B. Crystallography

COO-1198-1261 PC **A02**/MF **A01**
Illinois Univ. at Urbana-Champaign Materials Research Lab.
Growth of Bismuth Tungstate Single Crystals.
A. G. De L'Eprevier. 1979, 7p CONF-790420-11
Contract EY-76-C-02-1198
International symposium on ceramics in nuclear waste management, Cincinnati, OH, USA, 30 Apr 1979.

Descriptors: Bismuth oxides, Tungsten oxides, Crystal growth, Crystal structure, Monocrystals, Phase transformations.
Identifiers: ERDA/360201, ERDA/360202, *Bismuth tungstates, Single crystals.

For abstract, see ERA citation 04:041289.

20C. Electricity and Magnetism

N79-28423/8GA PC **A08**/MF **A01**
Pennsylvania State Univ., University Park. Electrical Engineering Dept.

Dipole and Quadrupole Synthesis of Electric Potential Fields.
Master's Thesis,
D. G. Tilley. Jul 79, 166p NASA-CR-158850
Grant NSG-3166

Descriptors: Electrostatics, *Potential fields, *Quadrupoles, *Dipoles, Electric potential, Laplace equation.

For abstract, see STAR 1719

20D. Fluid Mechanics

AD-A070 709/1GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
Linear Stability of Self-Similar Flow: 5. Convective Instability in Bounded Uniform Self-Gravitating Spheres.
Interim rept.,
Ira B. Bernstein, and David L. Book. 6 Jun 79, 14p Rept no. NRL-MR-4018
See also AD-A060 835.

Descriptors: *Fluid flow, Stability, Thermal instability, Spheres, Gravitational fields, Convection(Atmospheric), Perturbation theory.
Identifiers: Gravitational instability, Convective instability.

A new type of instability, similar to thermal convective instabilities, has been found to occur in self-gravitating spherical clouds uniformly expanding or collapsing in a vacuum. Unlike the Jeans instability, it has a growth rate which increases with zonal mode number 1, so that objects of arbitrarily small size are unstable. The modes are compressional and have non-vanishing vorticity. The eigenfunctions peak at the boundary, so the perturbations develop predominantly into surface irregularities. The perturbation amplitudes grow algebraically at first, then at late times become proportional to the cloud radius R(t). For a collapsing system in which stars are produced by the condensation of diffuse matter the theory predicts fragmentation and enhanced condensation in the peripheral regions. (Author)

AD-A070 742/2GA PC **A04**/MF **A01**
Martin Marietta Labs Baltimore MD
Unsteady Boundary Layer Separation.
Technical rept.,
K. C. Wang. Apr 79, 70p Rept no. MML-TR 79-16c
Contract N00014-77-C-0650

Descriptors: *Boundary layer flow, *Flow separation, Two dimensional flow, Three dimensional flow, Skin friction, Cylindrical bodies, Numerical analysis.
Identifiers: Unsteady flow.

A new separation criterion for two-dimensional unsteady boundary layers is proposed here. This criterion is derived by analogy, from its counterpart for steady, three-dimensional boundary layer. Analogous limiting streamlines for the unsteady, two-dimensional case are first defined, and an envelope of these streamlines is used to signify unsteady separation. To demonstrate this procedure, two previously studied problems are recalculated here. These are the unsteady responses to (1) a sudden change in velocity in Howarth's problem, and (2) an impulsively-started circular cylinder. Our conclusion regarding separation for the cylinder problem disagrees with that of the Telionis and Tsahalis based on the singularity criterion, but appears to be consistent with the prediction of Proudman and Johnson. Finally, we propose a three-dimensional, unsteady separation criterion on the basis of repeated applications of either the steady, three-dimensional separation criterion at successive times or the unsteady, two-dimensional separation criteion at fixed coordinate planes. (Author)

AD-A070 874/3GA PC **A02**/MF **A01**
Brown Univ Providence RI Div of Engineering
Generation of Interfacial Gravity Waves by Submerged Regions of Fluctuating Hydrodynamical Motions and Fluid Inhomogeneities.
Technical rept.,
J. T. C. Liu. 13 Mar 78, 7p
Contract N00014-76-C-0363
Pub. in Physics of Fluids, v22 n5 p814-818.

Descriptors: *Incompressible flow, *Gravity waves, Interfaces, Poisson equation, Potential flow, Momentum, Reprints.
Identifiers: Boussinesq equations.

No abstract available.

AD-A070 878/4GA PC **A02**/MF **A01**
Northwestern Univ Evanston IL Dept of Physics and Astronomy
Kinetic Theory of Turbulent Flows II,
M. B. Lewis. 22 Dec 76, 7p
Contract N00014-76-C-0089
Pub. in The Physics of Fluids, v20 n7 p1058-1063 Jul 77.

Descriptors: *Turbulent flow, Kinetics, Boltzmann equation, Flow fields, Reprints.

No abstract available.

AD-A070 899/0GA PC **A02**/MF **A01**
California State Univ Long Beach Dept of Mechanical Engineering
An Unsteady Laminar Boundary Layer with Separation and Reattachment,
Tuncer Cebeci. 23 Jun 78, 3p
Contract N00014-77-C-0156
Pub. in AIAA Jnl., v16 n12 p1305-1306 Dec 78.

Descriptors: *Flow separation, *Laminar boundary layer, Boundary layer flow, Nonuniform flow, Skin friction, Reprints.

No abstract available.

AD-A071 003/8GA PC **A02**/MF **A01**
Cold Regions Research and Engineering Lab Hanover NH
Turbulent Heat Transfer in Large Aspect Channels,
F. D. Haynes, and G. D. Ashton. May 79, 11p Rept no. CRREL-79-13

Descriptors: *Heat transfer, *Turbulent flow, *Channels, Rectangular bodies, Fluid flow, Water, Ice.

Heat transfer in turbulent flow was measured in a rectangular channel with a width of 0.254 m and a flow depth of 0.0254 m. Correlations between the Nusselt and Reynolds numbers are given for a range of $3020 < Re < 22360$. A Prandtl number range of $9.90 < or = Pr < or = 12.28$ for water was used in the tests. The results are compared with those of other investigations and show that some well-known correlations underpredict the heat transfer by about 35%.

AD-A071 048/3GA PC **A04**/MF **A01**
Binary Systems Inc Salida CO
Further Results on an Array Design to Measure the Wavenumber-Frequency Spectrum Beneath an Axisymmetric Turbulent Boundary Layer.
Final rept.,
Lowell W. Brooks. 5 Feb 79, 75p Rept no. CBR-79-01
Contract N00014-72-C-0318

Descriptors: *Turbulent boundary layer, Electroacoustic transducers, Acoustic arrays, Walls, Pressure, Spectrum analysis, Frequency, Dynamic range, Axisymmetric, Towed arrays, Rings, Cylindrical bodies.
Identifiers: Wave vector filtering, Design.

This report describes the requirements on a flush mounted array designed to measure the wavenumber-frequency spectrum of the axisymmetric component of wall pressure beneath an axially towed cylinder. Measurement of the low wavenumber content is emphasized. The effect of the wavenumber spectral dynamic range as well as channel-to-channel amplitude, phase and position tolerances are evaluated. (Author)

AD-A071 137/4GA PC **A02**/MF **A01**
Michigan Univ Ann Arbor Dept of Electrical and Computer Engineering
The Performance of a Vectorized 3-D Navier-Stokes Code on the CRAY-1 Computer.
Interim rept.,
J. S. Shang, P. G. Buning, W. L. Hankey, and M. C. Wirth. Jul 79, 11p AFOSR-TR-79-0790
Grant AFOSR-75-2812

Descriptors: *Navier Stokes equations, *Three dimensional flow, Machine coding, Computer programming, Time dependence, High rate, Numerical methods and procedures, Supersonic diffusers, Wind tunnels, Turbulence, Shock waves.
Identifiers: CRAY-1 computers, MacCormack method, Performance evaluation.

A three-dimensional, time dependent Navier-Stokes code using MacCormack's explicit scheme has been vectorized for the CRAY-1 computer. Computations were performed for a turbulent, transonic, normal shock wave boundary layer interaction in a wind tunnel diffuser. The vectorized three-dimensional Navier-Stokes code on the CRAY-1 computer achieved a speed of 128 times that of the original scalar code processed by a CYBER 74 computer. The vectorized version of the code outperforms the scalar code on the CRAY computer by a factor of 8.13. A comparison between the experimental data and the numerical simulation is also made. (Author)

BNL-NUREG-25616 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
One-Dimensional Model of Vapor Generation in Steady Flashing Flow.
B. J. C. Wu, P. Saha, N. Abuaf, and O. C. Jones, Jr. 1979, 11p CONF-790602-6
Contract EY-76-C-02-0016
ANS annual meeting, Atlanta, GA, USA, 3 Jun 1979.

Descriptors: *Two-phase flow, Depressurization, Flashing, Flow rate, Mathematical models, Vapor generators.
Identifiers: ERDA/420400.

For abstract, see ERA citation 04:041446.

CONF-790505-7 PC **A02**/MF **A01**
Idaho National Engineering Lab., Idaho Falls.
Interpreting Two State Instruments for Intermediary Values.
R. R. Good. 1979, 9p
Contract EY-76-C-07-1570
25. ISA international instrumentation symposium, Anaheim, CA, USA, 7 May 1979.

Descriptors: *Boiling detection, *Measuring instruments, Data analysis, Two-phase flow, Voids.
Identifiers: ERDA/440300.

For abstract, see ERA citation 04:043698.

DP-MS-78-83 PC **A03**/MF **A01**
Du Pont de Nemours (E.I.) and Co., Aiken, SC. Savannah River Lab.
Numerical Solution of Recirculating Flow by a Simple Finite Element Recursion Relation.
D. W. Pepper, and R. E. Cooper. 1979, 27p CONF-790311-4
Contract EY-76-C-09-0001
International conference on comp. meth. in nonlinear mech. Austin, TX, USA, 26 Mar 1979.

Descriptors: *Laminar flow, Finite element method, Flow models, Natural convection, Rectangular configuration, Simulation, Two-dimensional calculations.
Identifiers: ERDA/420400.

For abstract, see ERA citation 04:043617.

LA-UR-79-4 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Systematic Modeling Rules for Reynolds Stress Closures in Free-Shear Layers.
R. C. Mjolsness. 1979, 7p CONF-790624-1
Contract W-7405-ENG-36
21. annual ASME conference symposium on turbulent boundary layers, Niagara Falls, NY, USA, 18 Jun 1979.

Descriptors: *Fluid mechanics, Boundary layers, Mathematical models, Reynolds number, Stresses, Tensors, Turbulence, Turbulent flow.
Identifiers: ERDA/640410.

For abstract, see ERA citation 04:043937.

M-101 PC **A05**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
OASIS: A General Purpose Mesh Generator for Finite Element Codes.
M. A. Gerhard. 26 Apr 79, 89p

Contract W-7405-ENG-48

Descriptors: *Computer codes, *Finite element method, *Fluid mechanics, Boundary-value problems, Cdc computers, Computer calculations, Coordinates, Hydrodynamics, Interpolation, O codes, Three-dimensional calculations, Two-dimensional calculations.
Identifiers: ERDA/640410, ERDA/990200.

For abstract, see ERA citation 04:045540.

NUREG/CR-0763 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Application of Implicit Numerical Methods to Problems in Two-Phase Flow.
J. H. Mahaffy, and D. R. Liles. Mar 79, 15p LA-7770-MS
Contract W-7405-ENG-36

Descriptors: *Blowdown, Bwr type reactors, Pwr type reactors, Calculation methods, Computer calculations, Numerical solution, *Two-phase flow.
Identifiers: ERDA/220900, ERDA/210100, ERDA/210200, ERDA/420400.

For abstract, see ERA citation 04:043024.

N79-28135/8GA PC **A05**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Measurements in the Turbulent Boundary Layer at Constant Pressure in Subsonic and Supersonic Flow. Part 2: Laser-Doppler Velocity Measurements.
Final Report, May 1975 - Feb. 1978.
P. E. Dimotakis, D. J. Collins, and D. B. Lang. Jul 79, 90p NASA-CR-158839, JPL-PUB-79-41-PT-2
Contracts NAS7-100, F44620-75-C-0007

Descriptors: *Laser Doppler velocimeters, Reynolds stress, *Turbulent boundary layer, Flow velocity, Subsonic flow, Supersonic flow.

For abstract, see STAR 1719

N79-28317/2GA PC **A09**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Rheology of Polymeric Liquids.
1978, 200p VKI-LECTURE-Ser-1978-1
Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 16-20 Jan. 1978.

Descriptors: Conferences, *Liquids, *Polymer physics, *Rheology, Viscous flow, Birefringence, Forming techniques, Optical properties, Shear strain, Strain rate, Stress tensors, Viscometry.
Identifiers: *Meetings.

For abstract, see STAR 1719

N79-28458/4GA PC **A09**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Statistical Theory of Turbulence.
1970, 193p VKI-LECTURE-Ser-17
Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 12-16 Jan. 1970.

Descriptors: Equations of motion, Homogeneous turbulence, Nonuniform flow, Statistical analysis, *Turbulence, Velocity distribution, Approximation, Astrophysics, Functionals, Geophysics, Incompressible flow, Mathematical models.
Identifiers: *Meetings.

For abstract, see STAR 1719

N79-28472/5GA PC **A18**/MF **A01**E
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Computational Fluid Dynamics, Volume 1.
1978, 404p VKI-LEC-SER-1978-4-V-1
Seri-2. Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 13-17 Mar. 1978.

Descriptors: Computer programming, Conferences, *Fluid dynamics, *Numerical analysis, Finite element method, Flow stability, Hydrodynamics, Inviscid flow, Subsonic flow, Transonic flow, Viscous flow.
Identifiers: *Meetings.

For abstract, see STAR 1719

N79-28478/2GA PC **A14**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Computational Fluid Dynamics, Volume 2.
1978, 322p VKI-LEC-SER-1978-4-V-2
Seri-2. Conf-Lectures Held at Rhode-Saint-Genese, Belgium 13-17 Mar. 1978.

Descriptors: Computer programs, Conferences, *Fluid dynamics, *Numerical analysis, Finite difference theory, Finite element method, Inviscid flow, Mathematical models, Navier-stokes equation, Transonic flow, Viscous flow.
Identifiers: *Meetings.

For abstract, see STAR 1719

SAND-79-0209C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Variable Grid Scheme for Discontinuous Grid Spacing and Derivatives.
F. G. Blottner. 1979, 16p CONF-790614-2
Contract EY-76-C-04-0789
National computer conference 1979, New York, NY, USA, 4 Jun 1979.

Descriptors: *Boundary layers, *Turbulent flow, Accuracy, Analytical solution, Finite difference method, Friction, Viscosity.
Identifiers: ERDA/420400.

For abstract, see ERA citation 04:041451.

20E. Masers and Lasers

AD-A070 759/6GA PC **A07**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 33. January-February 1978.
Feb 79, 140p Rept no. DIA-DST-1740Z-001-79

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for January-February 1978 and is number 33 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 760/4GA PC **A05**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 34. March-April 1978.
Mar 79, 89p Rept no. DIA-DST-1740Z-002-79

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for March-April 1978 and is Number 34 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 761/2GA PC **A05**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 35. May - June 1978.
Apr 79, 97p Rept no. DIA-DST-1740Z-003-79

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for May-June 1978 and is no. 35 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 762/0GA PC **A06**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 36. July-August 1978.
May 79, 115p Rept no. DIA-DST-1740Z-004-79

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for July-August 1978 and is Number 36 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 763/8GA PC **A06**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 29. May-June 1977.
Aug 78, 105p Rept no. DIA-DST-1740Z-003-78

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for May-June 1977 and is Number 29 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 764/6GA PC **A05**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 30. July-August 1977.
Sep 78, 80p Rept no. DIA-DST-1740Z-004-78

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for July-August 1977 and is Number 30 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 765/3GA PC **A06**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 31. September-October 1977.
Oct 78, 101p Rept no. DIA-DST-1740Z-005-78

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for September-October 1977 and is Number 31 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 766/1GA PC **A05**/MF **A01**
Defense Intelligence Agency Washington DC
Bibliography of Soviet Laser Developments. Number 32. November-December 1977.
Dec 78, 98p Rept no. DIA-DST-1740Z-006-78

Descriptors: *Lasers, *Bibliographies, USSR.
Identifiers: *Foreign technology, Laser applications.

This is the Soviet Laser Bibliography for November-December 1977 and is Number 32 in a continuing series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; beam propagation; computer technology; holography; laser-induced chemical reactions; measurement of laser parameters; laser measurement applications; laser-excited optical effects; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-A070 823/0GA PC **A02**/MF **A01**
Westinghouse Research and Development Center Pittsburgh PA
TlHg Laser Development Program.
Final rept. 1 Feb 78-31 Jan 79 on Phase 1,
C. S. Liu, R. K. Williams, and L. A. Weaver. 10 Apr 79, 23p
Contract N00014-78-C-0131

Descriptors: Gas lasers, *Gas discharges, *Thallium compounds, Xenon, *Mercury compounds, Lasers, Thallium, Mercury, Fluorescence, Laser pumping, Blue, Green.
Identifiers: Excimers, *Excimer lasers, Metal vapor lasers, Mercury thallium lasers.

This report describes the results of an experimental study of the TlHg excimer system. A comparative evaluation of TlXe and TlHg candidates has indicated that the TlHg excimer is the most promising system for detailed study. An all-hot, sealed-off transverse discharge tube and a pressurized oven assembly have been fabricated and tested successfully. This experimental apparatus will permit the study of most metal excimer discharges at temperatures up to 1000 C and pressures up to 10 atm. Preliminary tests have shown that pulsed TlHg discharges suitable for excimer laser feasibility studies can be produced in the experimental apparatus. It is recommended that fluorescence and gain measurements of TlHg discharges proceed immediately, with laser tests to follow it warranted. (Author)

AD-A070 971/7GA PC **A05**/MF **A01**
Owens-Illinois Inc Toledo OH
Investigation of Broad-Band Emitters as Potential Lasing Ions Between 0.5 and 1.0 micrometers.
Final rept. 1 Jun 76-30 Sep 78,
Charles F. Rapp, Norman L. Boling, and Cloyce M. Carlen. 2 Apr 79, 77p AFOSR-TR-79-0736
Contract F44620-76-C-0088

Descriptors: *Glass lasers, *Tunable lasers, *Infrared lasers, *Laser materials, Visible spectra, Near infrared radiation, Laser pumping, Dye lasers, Pulsed lasers, Absorption spectra, Emission spectra, Phosphates, Borates, Silicates, Gain, Germanium, Ytterbium, Antimony, Tin, Copper, Europium, Ions, Fluorescence, Broadband.
Identifiers: Visible lasers.

Ions exhibiting broad fluorescence bands in the 5000A to 10,000A region have been studied as potential lasing ions in various glass hosts. Included in the study were Eu(2+), Cu(+), Sn(2+), Sb(2+), Yb(2+), Ge(2+), and CdS. Glass hosts included silicates, borates, and phosphates. Spectral data were used to calculate peak emission cross sections and flashlamp pumping thresholds for various ion-host combinations. These data indicated that Eu(2+) should lase easily. Cu(+), Sn(2+), and Sb(2+) should also lase but would require significantly greater pumping energies. Gain (loss) measurements were made on selected glass rods by passing a CW laser beam through the rods during flashlamp pumping. No gain was measured. Instead, most rods showed a pumped absorption. This absorption was probably due to transient color center formation in the glass hosts themselves, rather than excited state absorption by the dopant ions. Flashlamp pumping studies of several of the ions in various hosts selected for low pumped absorption is recommended as further work. Also recommended is laser pumping, which would eliminate the shorter wavelength ultraviolet primarily responsible for color center formation. (Author)

AD-A071 018/6GA PC **A04**/MF **A01**
Illinois Univ at Urbana-Champaign Electro-Physics Lab
Multiple Photon Pumping of Molecular Lasers: Frequency Tunable and Far IR Lasers.
Interim rept. 1 Feb 78-31 Jan 79,
Paul D. Coleman. Apr 79, 75p UILU-ENG-79-2550, AFOSR-TR-79-0738
Grant AFOSR-76-2988

Descriptors: *Molecular lasers, *Optical pumping, Raman spectra, Resonance absorption, Two photon absorption, Tunable lasers, Far infrared radiation, Molecular energy levels, Stark effect, Ammonia.
Identifiers: *Ammonia lasers, Infrared lasers.

This annual report describes research on two-photon pumping of molecular lasers operating on hot band transitions of the molecules and the associated nonlinear effects (Raman and hyper-Raman) that contribute to the gain spectrum of the molecular system. Accessing the hot bands of a molecule results in more lasing transitions that would otherwise be observed, and modifies the characteristics of the gain spectrum, i.e., the saturation, AC Stark shifts and width. Specific experiments described are: infrared-microwave pumping of NH3, infrared-infrared pumping on NH3, and hot band lasing in NH3. Ammonia has been chosen for study since absorption and laser assignments can readily be made for it. (Author)

AD-A071 023/6GA PC **A04**/MF **A01**
GTE Labs Inc Waltham MA
New Lasers Based on Transition Metal Complexes.
Final rept. 1 Oct 76-1 Oct 78,
L. Andrews, E. Johnson, and A. Lempicki. Apr 79, 69p TR-79-740.1, AFOSR-TR-79-0832
Contract F49620-77-C-0015

Descriptors: *Tunable lasers, *Transition metals, *Metal complexes, Visible spectra, Ruthenium, Iridium, Rhenium, Nitrogen heterocyclic compounds, Rhodium, Phosphine, Emission spectra, Life expectancy, Literature surveys, Glass lasers, Resonators, Spectroscopy, Excitation, Polarization, Chemical lasers.

The purpose of this program has been to investigate the possibility that luminescent transition metal complexes (TM complexes) might serve as the basis for a new class of lasers tunable in the visible spectral region. At the beginning of the program, sufficient spectroscopic and photophysical data were available to permit calculation of threshold requirements for these new materials, and they were found to lie well within the range of conventional pump sources. (Author)

AD-A071 087/1GA PC **A03**/MF **A01**
Naval Research Lab Washington DC
The Electron Cyclotron Maser as a High-Power Travelling-Wave Amplifier of Millimeter Waves.
Interim rept.,
J. L. Seftor, V. L. Granatstein, K. R. Chu, P. Sprangle, and M. Read. 19 Jun 79, 29p Rept no. NRL-MR-3989

Descriptors: *Masers, Traveling wave tubes, Pulse amplifiers, Microwave amplifiers, Millimeter waves, Gain, Dynamic range, Electron beams, Relativity theory, Magnetic fields, High power, KA band, Bandwidth, Efficiency, Optimization, Stability.
Identifiers: *Electron cyclotron masers.

The electron cyclotron maser instability has been exploited as the basis for a new type of travelling wave amplifier which operates at unusually high power levels at millimeter wavelengths. The first experimental model of this amplifier has been operated at 35 GHz and has demonstrated a stable gain of 17 dB and an output power of 10 kW (unsaturated). The gain was linear over a dynamic range > 30 dB. The absolute value of the gain and its dependence on current and magnetic field were in excellent agreement with theoretical calculations. Bandwidth and saturated power have yet to be measured directly but no fundamental problems were observed which will prevent successful achievement of the design predictions (viz., bandwidth approximately 10%, power on the order of 100,000 watts, efficiency $> 10\%$). (Author)

NTIS/PS-79/0860/1GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Hydrogen Fluoride and Deuterium Fluoride Lasers (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Sep 79, 51p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Gas lasers, *Bibliographies, Laser materials, Hydrogen fluoride, Deuterium compounds.
Identifiers: *Hydrogen fluoride lasers, *Deuterium fluoride lasers.

This bibliography cites reports from the international literature on hydrogen fluoride (HF) and deuterium fluoride (DF) lasers. Included are articles covering flows, laser outputs, molecular relaxation, molecular rotation, energy conversion efficiency, reaction kinetics and laser materials. Articles are included on both continuous wave and pulsed lasers. (Contains 230 citations)

NTIS/PS-79/0861/9GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Ultraviolet Lasers (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1975-Jul 79,
Samuel C. Mauk. Sep 79, 46p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Ultraviolet lasers, *Bibliographies, Lasers, Ultraviolet radiation, Laser materials, Gas lasers.
Identifiers: TEA lasers.

This bibliography cites reports from the international literature on ultraviolet lasers. Included are articles covering laser outputs, far ultraviolet radiation, electron pumping, optical pumping, and laser materials. Articles concerning gas lasers, pulsed lasers, dye lasers, CO2 lasers, xenon fluoride lasers, and transversely excited atmospheric (TEA) lasers are included. (Contains 217 citations)

NTIS/PS-79/0862/7GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Neodymium YAG Lasers (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1976-Jul 79,
Samuel C. Mauk. Sep 79, 43p*
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Lasers, *Bibliographies, Solid state lasers, Laser materials.
Identifiers: *Neodymium YAG lasers, Neodymium lasers, YAG lasers, Laser applications.

This bibliography cites reports on neodymium YAG lasers. Included are articles covering laser materi-

als and outputs; laser mode locking; crystal, fiber, and nonlinear optics; optical pumping communications; energy conversion efficiency; and laser applications. Articles covering pulsed, continuous wave, solid state, Q switched, and infrared lasers, are included. (Contains 190 citations)

NTIS/PS-79/0863/5GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
X-Ray Lasers (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Sep 79, 28p
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Lasers, *Bibliographies, Laser beams, Far ultraviolet radiation, Gamma rays, Optical pumping.
Identifiers: *X ray lasers, Laser produced plasmas.

This bibliography of citations to the international literature concerns various aspects of x-ray lasers. Included are articles covering laser plasmas and outputs, plasma radiation, far ultraviolet radiation, gamma rays, optical pumping, optical resonators, and electron transitions. Articles concerning laser applications, laser materials, and laser fusion are also included. (Contains 114 citations)

NTIS/PS-79/0883/3GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, Va.
Neodymium YAG Lasers (A Bibliography with Abstracts).
Rept. for 1964-Jul 79,
Brian Carrigan. Sep 79, 172p*
Supersedes NTIS/PS-78/0808.

Descriptors: *Lasers, *Bibliographies, Design, Theory, Infrared lasers, Aluminates, Yttrium compounds, Optical equipment, Frequency converters, Fabrication, Tests, Performance evaluation, Abstracts.
Identifiers: *Neodymium YAG lasers, Yttrium aluminum garnets, Yttrium aluminates, Optical modulators, Mode locked lasers.

Federally-funded research reports on lasing of neodymium doped yttrium aluminum garnet are cited. Studies on design, fabrication, quantum efficiency, light pulses, stabilization, and testing are covered. Optical pumping, mode locking, frequency conversion, and modulation of these lasers are discussed. Laser applications such as optical communications, range finding, and tracking are included. Safety hazards and radiation damage related to neodymium YAG lasers are also covered. (This updated bibliography contains 166 abstracts, 17 of which are new entries to the previous edition.)

NTIS/PS-79/0894/0GA PC **N01**/MF **N01**
National Technical Information Service, Springfield, VA.
Dye Lasers. Volume 2. 1975-August, 1979 (A Bibliography with Abstracts).
Rept. for 1975-Aug 79,
Diane M. Cavagnaro. Sep 79, 275p*
Supersedes NTIS/PS-78/0872, NTIS/PS-77/0724, NTIS/PS-76/0614, NTIS/PS-75/539, and NTIS/PS-74/120. See also Volume 1, 1964-1974, NTIS/PS-76/0613.

Descriptors: *Dye lasers, *Bibliographies, Design, Development, Performance evaluation, Optical pumping, Optical communication, Excitation, Frequency modulation, Optical radar, Tests, Abstracts.
Identifiers: Organic dye lasers, Tunable lasers, Laser spectroscopy, Laser isotope separation.

The citations present studies on dye laser theory, design, components, optical systems, and frequency range. Abstracts on lasing dyes, pumping, tuning, excitation, molecular structure, and modulation are included. Studies on dye laser use in spectroscopy are covered. (This updated bibliography contains 268 abstracts, 67 of which are new entries to the previous edition.)

N79-28533/4GA PC **A07**/MF **A01**
Florida Univ., Gainesville. Dept. of Nuclear Engineering Sciences.
Basic Research Relevant to CW-Nuclear Pumped Lasers.
Final Report.
R. T. Schneider. Jun 79, 135p NASA-CR-158837
Contract NGL-10-005-089, Grant NSG-7299

Descriptors: *Gaseous fission reactors, Nuclear fission, *Nuclear pumped lasers, Kinetics, Research and development, Uranium fluorides.
Identifiers: Continuous wave lasers.

For abstract, see STAR 1719

PAT-APPL-6-041 141/GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Large Volume Multiple Path Nuclear Pumped Laser.
Patent Application,
R. J. DeYoung, and F. Hohl. Filed 21 May 79, 9p
N79-26385/1, NASA-CASE-LAR-12592-1
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of application available NTIS.

Descriptors: Laser pumping, Lasers, *Multipath transmission, Nuclear devices, Gas lasers, Laser cavities, Laser outputs, Mirrors, *Patent applications, Systems engineering.
Identifiers: *Nuclear pumped lasers.

A large volume multiple-path nuclear pumper laser, which improved characteristics over previous cylindrical nuclear pumped laser systems, is presented. Large volumes of gas are excited by using internal high reflectance mirrors that are arranged so that the optical path crosses back and forth through the excited gaseous medium. By adjusting the external dielectric mirrors of the laser, the number of paths through the laser cavity can be varied. Output powers were obtained that are substantially higher than the output powers of previous nuclear laser systems.

20F. Optics

AD-A070 675/4GA PC **A05**/MF **A01**
Hughes Research Labs Malibu CA
Wide Bandwidth Liquid Crystal Light Valve.
Final rept. 31 May-30 Oct 78,
P. Braatz, M. Little, V. Efron, and J. Grinberg.
May 79, 94p
Contract DAAK70-78-C-0100

Descriptors: *Liquid crystals, *Charge coupled devices, *Image converters, *Optical processing, Chips(Electronics), Radar signals, Signal processing, Real time, Contrast, Resolution, Broadband.

During this contract, we accomplished the following major tasks toward the development of a CCD liquid-crystal light valve. We have demonstrated a fully operational CCD LCLV with a contrast ratio of 50:1 and a spatial resolution of 12 lines across the device. An alternative chip dicing method has been developed that reduces degradation to the substrate by a factor of 100. In addition, a new CCD LCLV packaging technique has been developed that improves the light valve fabrication yield from 30% to 80%. (Author)

AD-A070 704/2GA PC **A02**/MF **A01**
Naval Weapons Center China Lake CA
Wavelength Repeatability of a Cary Model 14R Spectrophotometer.
Research rept.,
Marian E. Hills. May 79, 20p Rept no. NWC-TP-6109

Descriptors: Optical materials, *Spectrophotometers, Measuring instruments, Optical equipment components, Calibration, Bandpass filters, Interference analyzers, Narrowband, Ozone layer, Sounding rockets.
Identifiers: Reproducibility.

In our laboratory Cary spectrophotometers are used to measure the transmittance of optical components and materials. One instrument in particular, a Cary Model 14R spectrophotometer, is used to calibrate narrow-band interference filters. The precision of the wavelength measurements was determined using the D sub beta line of the deuterium source lamp as a wavelength standard. (Author)

AD-A071 006/1GA PC **A03**/MF **A01**
Massachusetts Inst of Tech Lexington Lincoln Lab
Atmospheric Extinction. I. Synthetic Data.
Project rept.,
J. M. Sorvari. 12 Apr 79, 34p EST-43, ESD-TR-79-75
Contract F19628-78-C-0002

Descriptors: Solar radiation, Extinction, Coefficients, Photons, Absorption, Brightness, Reflection, Atmospheres, Space objects, Identification.
Identifiers: Space object identification, GEODSS system, *Atmospheric attenuation, *Light transmission.

Synthetic data, simulating the effects of atmospheric extinction on GEODSS observations, are presented. Approximate representations for the atmospheric extinction coefficients and for spectral photon distributions are also developed. Together these data are intended for evaluation of the effects of the atmosphere on space object identification data, and for the development and testing of models for correcting atmospheric extinction. (Author)

UCRL-52654 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Time-Dependent Propagation of High-Energy Laser Beams Through the Atmosphere: IV.
J. R. Morris, and J. A. Fleck, Jr. 15 Dec 78, 36p
Contract W-7405-ENG-48

Descriptors: *Laser radiation, Earth atmosphere, Laser weapons, Wave propagation.
Identifiers: ERDA/420200, ERDA/420300, *Atmospheric attenuation.

For abstract, see ERA citation 04:045206.

20G. Particle Accelerators

AD-A070 710/9GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
Report of Cyclotron Facility Operations October 1, 1978 through March 31, 1979.
Interim rept.,
Rollon O. Bondelid. 26 Jun 79, 14p Rept no. NRL-MR-4032

Descriptors: *Cyclotrons, Naval research, Ion beams, Fast neutrons, Radiotherapy, Cancer, Radiation damage, Electronic equipment, Reactor materials, Whole body irradiation, Dosimetry.
Identifiers: MANTA project.

This is the sixth in a series of quarterly reports summarizing the use of the Naval Research Laboratory Cyclotron Facility. During the six month period ending March 31, 1979, the cyclotron was used in support of six research programs for a total 930 hours of beam on target. These research programs are summarized in this report together with the details of beam time usage and facility engineering. No major operational problems were encountered. (Author)

BNL-25710 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Beam-Beam Force and Storage Ring Parameters.
J. C. Herrera. 1979, 14p CONF-790318-1
Contract EY-76-C-02-0016
Symposium on nonlinear dynamics and the beam-beam interaction, Upton, NY, USA, 19 Mar 1979.

Descriptors: *Storage rings, Beam dynamics, Beam-beam interactions, Colliding beams, Electromagnetic interactions, Electron beams, Positron beams, Weak interactions.
Identifiers: ERDA/430400, ERDA/430200.

For abstract, see ERA citation 04:045256.

BNL-25775 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Distributed Control System for the National Synchrotron Light Source.
K. Batchelor, B. B. Culwick, J. Goldstick, J. Sheehan, and J. Smith. 1979, 4p CONF-790327-136
Contract EY-76-C-02-0016
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Nsls, Control systems, Microprocessors, Programming, Specifications.

Identifiers: ERDA/430303.

For abstract, see ERA citation 04:043658.

BNL-25777 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
National Synchrotron Light Source VUV Storage Ring.
L. Blumberg, J. Bittner, J. Galayda, R. Heese, and S. Krinsky. 1979, 3p CONF-790327-137
Contract EY-76-C-02-0016
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Nsls, Electron beams, Far ultraviolet radiation, Mev range 100-1000, Specifications, Stability, Storage rings.
Identifiers: ERDA/430400.

For abstract, see ERA citation 04:043680.

LA-tr-79-10 PC **A02**/MF **A01**
Electrochemical Copper Coatings for Surface Finishing of HF Resonators.
W. D. Weiss. 1979, 23p
Contract W-7405-ENG-36
Translation source not available.

Descriptors: *Unilac, *Cavity resonators, Copper, Desorption, Electric conductivity, Electrodeposition, Electrodes, Quality control, Surface coating.
Identifiers: ERDA/430303, ERDA/360101, Translations, West Germany, *Copper coatings, *Ion accelerators.

For abstract, see ERA citation 04:041541.

LA-tr-79-11 PC **A02**/MF **A01**
Planning and Construction of the GSI Tank Copper-Plating Installation.
H. Gaiser. 1979, 10p
Contract W-7405-ENG-36
Translation source not available.

Descriptors: Copper, *Unilac, Building materials, Cavity resonators, Electrodeposition, Electrodes, Electroplating, Surface coating.
Identifiers: ERDA/430303, ERDA/360101, Translations, West Germany, *Ion accelerators, *Copper coatings.

For abstract, see ERA citation 04:041542.

LA-tr-79-4 PC **A02**/MF **A01**
Gosudarstvennyi Komitet po Ispol'zovaniyu Atomnoi Energii SSSR, Serpukhov. Inst. Fiziki Vysokikh Energii.
Linear Ion Accelerator with High-Frequency Strong Focusing. Dynamics of the Beam in Sections with Spatially Homogeneous Focusing: Part 2.
I. M. Kapchinskii. 1979, 25p
Contract W-7405-ENG-36
C INZH--72-30, July 1972.

Descriptors: *Linear accelerators, Beam dynamics, Electrodes, Focusing, Mathematical models, Oscillations, Standing waves.
Identifiers: ERDA/430200, Translations, USSR.

For abstract, see ERA citation 04:041489.

LBL-8342 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Measurements and Correction of the PEP Interaction Region Quadrupole Magnets.
R. M. Main, J. T. Tanabe, and K. Halbach. Mar 79, 5p CONF-790327-114
Contract W-7405-ENG-48
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Beam focusing magnets, *M2-transitions, *Pep storage rings, Corrections, Magnetic fields, Measuring methods.
Identifiers: ERDA/430303.

For abstract, see ERA citation 04:041530.

LBL-8809 PC **A02**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Possible Lower Limit to Licac Emittance.
J. W. Staples, and R. A. Jameson. Mar 79, 5p
CONF-790327-89
Contract W-7405-ENG-48
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Linear accelerators, Beam currents, Beam emittance, Beam optics, Beam transport, Energy dependence, Limiting values.
Identifiers: ERDA/430200.

For abstract, see ERA citation 04:041490.

SLAC-PUB-2273 PC **A02**/MF **A01**
Stanford Linear Accelerator Center, CA.
Investigation of the Flip-Flop Beam--Beam Effect in SPEAR.
M. H. R. Donald, and J. M. Paterson. Mar 79, 3p CONF-790327-84
Contract EY-76-C-03-0515
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Spear, Beam dynamics, Beam-beam interactions, Colliding beams, Electron beams, Phase stability, Proton beams, Tuning.
Identifiers: ERDA/430200.

For abstract, see ERA citation 04:045250.

SLAC-PUB-2276 PC **A02**/MF **A01**
Stanford Univ., CA.
PEP Computer Control System.
Mar 79, 4p PEP-NOTE-286, CONF-790327-124
Contract EY-76-C-03-0515
IEEE particle accelerator conference, San Francisco, CA, USA, 12 Mar 1979.

Descriptors: *Pep storage rings, Beam monitoring, Camac system, Computer networks, Control systems.
Identifiers: ERDA/430303.

For abstract, see ERA citation 04:041537.

UCRL-Trans-11460 PC **A03**/MF **A01**
Technische Univ. Munich, Garching (Germany, F.R.). Physik-Dept.
Study of the Superconducting Sector Cyclotron SUSE at the Tandem Accelerator of the Munich Accelerator Laboratory.
1979, 34p
Contract W-7405-ENG-48
Translation source not available.

Descriptors: *Cyclotrons, Accelerator facilities, Cavity resonators, Cost, Design, Heavy ion accelerators, Superconducting magnets, Uses.
Identifiers: ERDA/430303, Translations, West Germany.

For abstract, see ERA citation 04:041543.

20H. Particle Physics

AD-A070 593/9GA PC **A03**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Cyclotron Maser Instability for General Magnetic Harmonic Number,
Hwan-Sup Uhm, Ronald C. Davidson, and K. R. Chu. 1975, 40p
Contracts N00014-75-C-0309, N00014-67-A-0239

Descriptors: Masers, *Cyclotron resonance, Transverse waves, Harmonic analysis, Waveguides, *Electron beams, Stability, Doppler effect, Equilibrium(General), Maxwells equations.
Identifiers: Vlasov-Maxwell equations, Relativistic electron beams, Magnetic fields.

This paper examines the cyclotron maser instability for general magnetic harmonic number transverse electric (TE) and transverse magnetic (TM) waveguide modes in a conducting cylinder of radius R sub c. The analysis is carried out for a hollow electron beam (radius R sub 0) propagating parallel to a uniform axial magnetic field B sub 0 e sub z. It is assumed that nu/gamma sub 0 $<<<$ 1, where nu is Budker's parameter and gamma sub 0 mc-squared is the electron energy in a frame of reference moving with the beam axial velocity beta sub b ce sub z. One of the most important features of the analysis is that the instability growth rate for magnetic harmonic numbers s = 2,3,... is comparable to the growth rate of the fundamental (s = 1) mode, particularly for moderate electron energy. Moreover, it is shown that the instability growth rate can be maximized by appropriate choice of the geometric parameter R sub 0/R sub c.

AD-A070 594/7GA PC **A02**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Cyclotron Maser Instability for Intense Solid Electron Beams,
Hwan-Sup Uhm, and Ronald C. Davidson. 1975, 25p
Contracts N00014-75-C-0309, N00014-67-A-0239
Prepared in cooperation with the Department of Energy, Washington, DC. Office of Fusion Energy.

Descriptors: Masers, *Cyclotron resonance, *Electron beams, Stability, Maxwells equations, Electron energy, Optimization, Doppler effect, Eigenvalues, Perturbations, Waveguides, Harmonic analysis.
Identifiers: Vlasov-Maxwell equations, Relativistic electron beams, Magnetic fields.

The cyclotron maser instability for a solid relativistic electron beam propagating parallel to a uniform axial magnetic field B sub 0 e sub z is investigated. The stability analysis is carried out within the framework of the linearized Vlasov-Maxwell equations. It is assumed that nu/gamma $<<$ 1, where nu is Budker's parameter and gamma mc-squared is the electron energy. Stability properties are investigated for the choice of equilibrium distribution function in which all electrons have the same value of total perpendicular energy, the same value of axial velocity, and a step-function distribution in canonical angular momentum. The instability growth rate is calculated including a determination of the optimum value of the beam radius R sub 0 for maximum growth. It is found that the maximum growth rate for a solid beam is comparable to the maximum growth rate for a hollow beam. (Author)

AD-A071 072/3GA PC **A04**/MF **A01**
Naval Postgraduate School Monterey CA
Inelastic Electron Scattering from 7Li in the Vicinity of the Alpha - Triton Threshold.
Master's thesis,
Robert Francis Ryan. Mar 79, 63p

Descriptors: *Lithium, *Inelastic scattering, *Electron scattering, Cross sections, Alpha particles, Tritons, Electron accelerators, Computer programs, Theses.
Identifiers: Lithium 7, MeV range 01-10.

Inelastic electron scattering experiments were carried out on (7)Li within a range of momentum transfer squared of .2 is less than sq q is less than .65(1/sq F). Inelastic cross section and form factors were determined for the 4.55 MeV inelastic peak and the inelastic continum caused by the disintegration of (7)Li into an alpha particle and a triton above the threshold of 2.45 MeV.

BNL-24848 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Neutrino--Deuterium Reactions in the 7-Foot Bubble Chamber.
A. M. Cnops, P. L. Connolly, S. A. Kahn, H. G. Kirk, and M. J. Murtagh. 1978, 15p CONF-780762-8
Contract EY-76-C-02-0016
Conference on neutrino physics at accelerators, Oxford, UK, 3 Jul 1978.

Descriptors: *Neutrino-deuteron interactions, *Neutrino-neutron interactions, Born approximation, Bubble chambers, Charmed baryon resonances, Cvc theory, Deuterium, Exclusive interactions, Experimental data, Hydrogen, Isolated values, Mass, Muon neutrinos, Muons minus, Protons, Quasi-elastic scattering, Strangeness, V-a theory.
Identifiers: ERDA/645102.

For abstract, see ERA citation 04:039819.

BNL-tr-678 PC **A02**/MF **A01**
Joint Inst. for Nuclear Research, Dubna (USSR).
Detection of a New Spontaneously Fissioning Nuclide in Some Meteorites.
G. N. Flerov, G. M. Ter-Akop'yan, A. G. Popeko, B. V. Fefilov, and V. G. Subbotin. 1977, 13p
Contract EY-76-C-02-0016

C J.I.N.R. Preprint P6-10581.

Descriptors: *Actinide nuclei, *Meteorites, *Trans 104 elements, Abundance, Background radiation, Chemical composition, Experimental data, Isolated values, Natural occurrence, Neutron spectra, Radiation detection, Spontaneous fission, Uranium.
Identifiers: ERDA/652021, ERDA/640101, Translations.

For abstract, see ERA citation 04:039919.

CONF-7810113-1 PC **A05**/MF **A01**
Oak Ridge National Lab., TN.
Some Aspects of Heavy-Ion Scattering.
G. R. Satchler. 1978, 84p
Contract W-7405-ENG-26
INS summer school on nuclear physics, Dogashima, Japan, 30 Oct 1978.

Descriptors: *Heavy ion reactions, Angular distribution, Elastic scattering, Gev range 01-10, Lectures, Mev range 100-1000, Nuclear potential, Nuclear reaction kinetics, Optical models, Quasi-elastic scattering, Reviews, Yukawa potential.
Identifiers: ERDA/653003.

For abstract, see ERA citation 04:028399.

COO-2232A-75 PC **A02**/MF **A01**
European Organization for Nuclear Research, Geneva (Switzerland).
Status Report on Experiment R-108.
A. L. S. Angelis, H. J. Besch, and R. L. Cool.
1978, 12p
Contract EY-76-C-02-2232

Descriptors: *Proton-proton interactions, Electron pairs, Experimental data, Graphs, Particle production, Pions neutral, Research programs, Transverse momentum.
Identifiers: ERDA/645103, ERDA/645101.

For abstract, see ERA citation 04:041868.

COO-3071-238 PC **A02**/MF **A01**
Fermi National Accelerator Lab., Batavia, IL.
Measurement of the Y-Distributions in Antineutrino Inelastic Interactions with Nucleons.
A. Benvenuti, F. Bobisut, and D. Cline. 1978, 18p
CONF-780453-13
Contract EY-76-C-02-3071
Neutrinos, West Lafayette, IN, USA, 28 Apr 1978.

Descriptors: *Antineutrino-nucleon interactions, Cross sections, Distribution, Energy dependence, Energy spectra, Experimental data, Gev range 10-100, Gev range 100-1000, Graphs, Inelastic scattering, Transverse momentum.
Identifiers: ERDA/645102.

For abstract, see ERA citation 04:043947.

COO-3533-136 PC **A03**/MF **A01**
Syracuse Univ., NY. Dept. of Physics.
Research Program in Elementary Particle Theory. Progress Report Ending June 30, 1980.
1980, 39p SU-4213-136
Contract EY-76-S-02-3533

Descriptors: *High energy physics, Research programs.
Identifiers: ERDA/645200.

For abstract, see ERA citation 04:043961.

DOE/ER-0027 PC **A03**/MF **A01**
Department of Energy, Washington, DC. Office of Energy Research.
High Energy Physics. Ultimate Structure of Matter and Energy.
Apr 79, 42p

Descriptors: *High energy physics, Accelerators, Electromagnetic interactions, Energy range, Leptons, Quarks, Reviews, Strong interactions, Weak interactions.
Identifiers: ERDA/645000.

For abstract, see ERA citation 04:043943.

IS-M-201 PC **A02**/MF **A01**
Ames Lab., IA.
Effective Interactions: Derivation of Moment Criteria.
B. J. Dalton. 1979, 9p CONF-790348-3
Contract W-7405-ENG-82
Conference on the p,n reaction and the nucleon-nucleon force, Telluride, CO, USA, 29 Mar 1979.

Descriptors: *Nuclei, *Snell models, Energy levels, Gauss function, Hamiltonians, Many-body problem, Moments method, Nuclear structure.
Identifiers: ERDA/653001.

For abstract, see ERA citation 04:044037.

LA-UR-79-1082 PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Fission Properties of Very Heavy Actinides.
D. C. Hoffman. 1979, 29p CONF-790507-4
Contract W-7405-ENG-36
IAEA symposium on physics and chemistry of fission, Julich, F.R. Germany, 14 May 1979.

Descriptors: *Actinide nuclei, *Fermium isotopes, Excitation, Fission fragments, Half-life, Kinetic energy, Mass spectra, Neutron emission, Reviews, Shell models, Spontaneous fission.
Identifiers: ERDA/652026.

For abstract, see ERA citation 04:044033.

LA-UR-79-1306 PC **A03**/MF **A01**
Los Alamos Scientific Lab., NM.
Distribution of Nuclear Charge and Angular Momentum in Chains 132-137, 99, and 102 of Thermal Neutron Fission of exp 235 U at Various Kinetic Energies and Charge States of the Fragments.
H. O. Denschlag, H. Braun, and K. Wolfsberg.
1979, 34p CONF-790507-5
Contract W-7405-ENG-36
IAEA symposium on physics and chemistry of fission, Julich, F.R. Germany, 14 May 1979.

Descriptors: *Uranium 235 target, Angular momentum, Auger effect, Collective model, Distribution, Electric charges, Energy-level transitions, Excitation, Fission fragments, Fission yield, Graphs, Isolated values, Isomeric nuclei, Nanosec living radioisotopes, Neutron reactions, Nuclear deformation, Pairing interactions, Parity, Shell models, Spin, Thermal fission, Tin 132, Variations.
Identifiers: ERDA/652016.

For abstract, see ERA citation 04:044026.

LA-7733-T PC **A09**/MF **A01**
Los Alamos Scientific Lab., NM.
Elastic Neutron-Proton Differential Cross Section at 647 MeV.
M. L. Evans. Apr 79, 176p
Contract W-7405-ENG-36

Descriptors: *Proton-neutron interactions, Charge-exchange interactions, Coupling constants, Differential cross sections, Elastic scattering, Experimental data, Graphs, Isolated values, Linear momentum, Mev range 100-1000.
Identifiers: ERDA/645103.

For abstract, see ERA citation 04:043955.

LA-7828-T PC **A12**/MF **A01**
Los Alamos Scientific Lab., NM.
Neutron--Proton Radius Differences and Isovector Deformations from pi exp + and pi exp - Inelastic Scattering from exp 18 O.
S. G. Iversen. May 79, 251p
Contract W-7405-ENG-36
Thesis.

Descriptors: *Oxygen 18 target, Angular distribution, Charge distribution, Elastic scattering, Energy-level transitions, Experimental data, Graphs, Inelastic scattering, Integral cross sections, Isolated values, Matrix elements, Mev range 100-1000, Neutrons, Nuclear deformation, Nuclear radii, Oxygen 18, Pion minus reactions, Pion plus reactions, Protons, Spectra, Tables.
Identifiers: ERDA/645103, ERDA/651225.

For abstract, see ERA citation 04:045556.

LBL-91(Rev.) PC **E02●**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
Compilation of Current High Energy Physics Experiments.
Sep 78, 43p
Contract W-7405-ENG-48

Descriptors: *High energy physics, Experiment planning, Indexes, Research programs.
Identifiers: ERDA/645100.

For abstract, see ERA citation 04:028316.

NTIS/PS-79/0873/4GA PC **N01**/MF **N01**
New Mexico Univ., Albuquerque. Technology Application Center.
Alpha Particles (Citations from the International Aerospace Abstracts Data Base).
Rept. for 1974-Jul 79,
Samuel C. Mauk. Sep 79, 38p
Sponsored in part by National Technical Information Service, Springfield, VA.

Descriptors: *Alpha particles, *Bibliographies, Nuclear fusion, Solar activity, Geomagnetism, Radiation effects, Magnetohydrodynamic stability.
Identifiers: Tokamak devices, Energy spectra, Plasma heating.

This bibliography of citations to the international literature covers various aspects of alpha particles as applied to controlled fusion devices, solar activity, and geomagnetically trapped particles. Included are articles concerning Tokamak devices, plasma heating and control, plasma-particle interactions, solar particles, solar wind, solar flares, energy spectra, and magnetohydrodynamic stability. Articles concerning effects of alpha particles on different kinds of devices are also included. (Contains 166 citations)

ORO-4699-T1 PC **A02**/MF **A01**
Louisiana State Univ., Baton Rouge.
Study of the Two Body Dissociation of Light Nuclei in Nuclear Fields. Progress Report, January 1, 1978--June 30, 1979.
P. N. Kirk, and R. W. Huggett. 1979, 5p
Contract EY-76-S-05-4699

Descriptors: *Lithium 6, Cluster model, Gev range 10-100, Lithium 6 reactions.
Identifiers: ERDA/651323.

For abstract, see ERA citation 04:041927.

UCRL-78482(Sup.) PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Atlas of Photoneutron Cross Sections Obtained with Monoenergetic Photons.
B. L. Berman. Jun 79, 22p
Contract W-7405-ENG-48

Descriptors: *Cobalt 59 target, *Manganese 55 target, *Osmium 186 target, *Osmium 188 target, *Osmium 189 target, *Osmium 190 target, *Osmium 192 target, *Thorium 232 target, *Uranium 235 target, *Uranium 236 target, *Uranium 238 target, Carbon 13 target, Cross sections, Experimental data, Graphs, Mev range 10-100, Oxygen 18 target, Photonuclear reactions, Tables, Total cross sections.
Identifiers: ERDA/651825, ERDA/651925, ERDA/652025, ERDA/651325.

For abstract, see ERA citation 04:044020.

UCRL-81888 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Spontaneous Fission of exp 259 Md.
E. K. Hulet, J. F. Wild, R. W. Lougheed, P. A. Baisden, and J. H. Landrum. 4 May 79, 18p
CONF-790507-6
Contract W-7405-ENG-48
IAEA symposium on physics and chemistry of fission, Julich, F.R. Germany, 14 May 1979.

Descriptors: *Fission fragments, *Mendelevium 259, Experimental data, Graphs, Half-life, Kinetic energy, Mass, Nuclear reaction kinetics, Spontaneous fission.
Identifiers: ERDA/652026.

For abstract, see ERA citation 04:044036.

UCRL-82570 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Identification of the Isovector Giant Quadrupole Resonance in exp 16 O Via the exp 16 O (gamma ,N sub 0).
T. W. Phillips, and R. G. Johnson. 5 Apr 79, 3p
CONF-790610-1

Contract W-7405-ENG-48
International conference on nuclear physics with electromagnetic interactions, Mainz, F.R. Germany, 5 Jun 1979.

Descriptors: *Oxygen 16, *Oxygen 16 target, *Photonuclear reactions, Angular distribution, Cross sections, Deuterium target, E2-transitions, Experimental data, Giant resonance, Isolated values, Legendre polynomials, Mev range 10-100, Multipoles, Series expansion.
Identifiers: ERDA/651323, ERDA/651325.

For abstract, see ERA citation 04:043987.

UH-511-330-79 PC **A02**/MF **A01**
Wisconsin Univ.-Madison. Dept. of Physics.
Some Remarks on Grand Unified Models.
S. Pakvasa. Jan 79, 5p CONF-781243-2
Contract EY-76-C-03-0511
Seminar on proton stability, Madison, WI, USA, 8 Dec 1978.

Descriptors: *Protons, *Unified gauge models, Coupling constants, Decay, Lifetime, Limiting values, Reviews, Stability.
Identifiers: ERDA/645201, ERDA/645206.

For abstract, see ERA citation 04:039835.

20I. Plasma Physics

AD-A070 545/9GA PC **A02**/MF **A01**
Naval Research Lab Washington DC
Direct Solution of the Equation of Transfer Using Frequency-and Angle-Averaged Photon Escape Probabilities.
Interim rept.,
J. P. Apruzese, and J. Davis. 21 Jun 79, 23p
Rept no. NRL-MR-4017

Descriptors: *Radiative transfer, *Plasmas(Physics), Transport properties, Transfer functions, Probability density functions, Photons, Resonance escape probability, Kernel functions, Coefficients.

A formalism is developed which permits direct steady-state solution of the transfer equation using escape probabilities probabilities averaged over angle and frequency. A matrix of probability-based coupling coefficients, which are related to the kernel K1 is used to obtain the source function for a doppler profile in plane-parallel geometry. Comparison is made with exact solutions, establishing the high accuracy of the technique. The method is extendable to different physical situations by simply modifying the coupling coefficients. (Author)

AD-A070 590/5GA PC **A04**/MF **A01**
STD Research Corp Arcadia CA
Magnetogasdynamic Phenomena in Pulsed MHD Flows.
Interim summary rept. 1 Aug 77-31 Oct 78,
S. T. Demetriades, D. M. Markham, C. D. Maxwell, D. A. Oliver, and T. F. Swean. Jan 78, 56p Rept nos. STD-UP-002-77-1, STDR-79-2
Contract N00014-77-C-0574

Descriptors: Magnetohydrodynamics, *Magnetohydrodynamic generators, Shock waves, Channel flow, Reynolds number, Shock tubes.

This report examines some of the detailed structure of magnetogasdynamic flows encountered in pulsed magnetohydrodynamic (MHD) generators. Two illustrations of magnetogasdynamic nonuniformities are considered. The first is for conventional explosive-driven MHD generators. Here we reveal the detailed structure of the deceleration of the conducting slug formed by the compression of plasma between the explosive-driven shock wave and its following contact surface. The second illustration is for steady high Magnetic Reynolds Number channel flows. Here we exhibit the nonuniform manner in which the external magnetic field is diffused into the plasma and the corresponding nonuniform deceleration of the flow. (Author)

AD-A070 592/1GA PC **A02**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Axially-Dependent Equilibrium of an Unneutralized Electron Beam in an Axial Magnetic Field,
J. Guillory. Jun 79, 19p
Contracts N00014-75-C-0309, N00014-67-A-0239

Descriptors: *Plasmas(Physics), *Electron beams, Spin states, Brillouin zones, Magnetic fields, Electron density, Mathematical analysis, Numerical quadrature.

Virtual cathode formation in vacuum-propagating beams may be more widespread than previously recognized. The spin death of parallel beam energy by E sub r x B sub z rotation in front of a density pileup, may assist or steepen the axial density gradient, since the rotation speed tends toward Brillouin flow, omega = omega sub c/2. It may be that the propagation limit (on the beam density) is not omega-squared sub p approx. equal omega-squared sub c in the applied or total magnetic field, but rather omega-squared sub p max (in the presence of self-field pileup) small enough that cE sub r/B sub z <V sub 0 (V sub 0 = beam electron speed), with E sub r given self-consistently from the charge distribution. In what follows, self-consistent BGK-like axially dependent equilibria will be described, in which the space charge effects determine the axial extent and profile of the beam. Generalization to axially nonuniform magnetic fields is relatively straightforward. Sections III and IV treat the problem in a purely one-dimensional way, keeping the electrostatic effects of E sub z electric fields but not the effects of beam rotation caused by E sub r. Section V generalizes these results to include E sub r.

AD-A070 597/0GA PC **A02**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Influence of Finite Ion Larmor Radius and Equilibrium Self Electric Fields on the Ion Resonance Instability,
Ronald C. Davidson, and Hwan-Sup Uhm. 1975, 13p
Contracts N00014-75-C-0309, N00014-67-A-0239
Prepared in cooperation with Energy Research and Development Administration, Washington, DC. Division of Magnetic Fusion Energy.

Descriptors: Plasmas(Physics), Resonance, Stability, Magnetic resonance, Ionization, Equilibrium(General), Ion density, Profiles.
Identifiers: *Larmor radius, *Plasma instability.

The influence of finite ion Larmor radius and equilibrium self-electric fields on the ion resonance instability in a nonneutral plasma column is examined, and a closed algebraic dispersion relation for the complex eigenfrequency omega is obtained. It is shown that finite ion Larmor radius effects can have a strong stabilizing influence for azimuthal mode numbers l > or = 2, particularly when the equilibrium self-electric field is sufficiently weak. (Author)

AD-A070 611/9GA PC **A03**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Stability Properties of a Field-Reversed Ion Layer in a Background Plasma,
Hwan-Sup Uhm, and Ronald C. Davidson. 1978, 48p
Contracts N00014-75-C-0309, N00014-67-A-0239

Descriptors: Plasmas(Physics), *Protons, Layers, Stability, Interactions, Ion density, Perturbations, Electromagnetic fields, Distribution functions, Temperature gradients, Confinement(General).
Identifiers: Vlasov equations, *Magnetohydrodynamic stability.

Stability properties of an intense proton layer (P-layer) immersed in a background plasma are investigated within the framework of a hybrid model in which the layer ions are described by the Vlasov equation, and the background plasma electrons and ions are described as macroscopic, cold fluids. Moreover, the stability analysis is carried out for frequencies near multiples of the mean rotational frequency of the layer. It is assumed that the layer is thin, with radial thickness (2a) much smaller than the mean radius (R sub 0). Electromagnetic stability properties are calculated for flute perturbations (del/del z=0) about a P-layer with rectangular density profile, described by the rigid-rotor equilibrium distribution function. Stability properties are investigated including the effects of the equilibrium magnetic field depression produced by the P-layer, transverse magnetic perturbations (delta B not = 0), small (but finite) transverse temperature of the layer ions, and the dielectric properties of the background plasma.

AD-A070 729/9GA Not available NTIS
Maryland Univ College Park Dept of Physics and Astronomy
High-Energy Ions from a Nd-Laser-Produced Plasma,
R. Decoste, and B. H. Ripin. 21 Mar 77, 4p
Contracts N00014-75-C-0309, N00014-67-A-0239
Prepared in cooperation with the Naval Research Lab., Washington, DC.
Availability: Pub. in Applied Physics Letters, v31 n2 p68-70, 15 Jul 77. (No copies furnished by DDC).

Descriptors: *Plasmas(Physics), Neodymium lasers, Energy transfer, Ionization, High energy, Ion ion interactions, Reprints.
Identifiers: *Laser produced plasmas.

No abstract available.

AD-A070 730/7GA Not available NTIS
Maryland Univ College Park Dept of Physics and Astronomy
Electron Impact Excitation Coefficients for Laboratory and Astrophysical Plasmas,
J. Davis, P. C. Kepple, and M. Blaha. 23 Mar 76, 13p
Contracts N00014-75-C-0309, N00014-67-A-0239
Prepared in cooperation with Naval Research Lab., Washinton, DC.
Availability: Pub. in Jnl. of Quantitative Spectroscopy and Radiative Transfer, v16 p1043-1055 1976. (No copies furnished by DDC).

Descriptors: *Plasmas(Physics), *Electron impact spectra, Reaction kinetics, Coefficients, Electron transitions, Tables(Data), Reprints.

No abstract available.

AD-A070 737/2GA Not available NTIS
Maryland Univ College Park Dept of Physics and Astronomy
Effects of Finite Plasma Beta on the Lower-Hybrid-Drift Instability,
R. C. Davidson, N. T. Gladd, C. S. Wu, and J. D. Huba. 27 May 76, 11p
Contracts N00014-75-C-0309, N00014-67-A-0239
Prepared in cooperation with the Naval Research Lab., Washington, DC.
Availability: Pub. in The Physics of Fluids, v20 n2 p301-310 Feb 77. (No copies furnished by DDC).

Descriptors: *Plasmas(Physics), Stability, Drift, Plasma waves, Perturbations, Reprints.
Identifiers: *Drift instability, Beta ratio.

No abstract available.

AD-A070 819/8GA PC **A06**/MF **A01**
Northrop Research and Technology Center Palos Verdes Peninsula CA
Plasma Sheath Processes.
Final technical rept. 15 Aug 77-31 Oct 78,
William H. Long, Jr. Apr 79, 123p NRTC-78-46R, AFAPL-TR-79-2038
Contract F33615-77-C-2048

Descriptors: *Plasmas(Physics), Electric discharges, Electrodes, Boundary layer, Electric fields, Electrons, Ions, Kinetics, High pressure, Gas ionization, Gas flow, Boltzmann equation.
Identifiers: *Plasma sheath.

A model of the plasma sheath in high pressure ionized gas flows is presented. Nonequilibrium electron energy distributions are determined from a numerical solution of the collisional Boltzmann equation in the presence of strong field and density gradients. Self-consistent coupling to the electric field, ion kinetics and gas dynamics is included. In subsonic flows, the sheath and the boundary layer can be treated independently. A stability analysis indicates two forms of thermal instability occur in the cathode sheath at high pressures. (Author)

AD-A071 017/8GA PC **A14**/MF **A01**
Polytechnic Inst of New York Farmingdale Dept of Electrical Engineering

Studies on the Interactions between Electromagnetic Fields and Plasmas.
Final rept. Apr 74-Sep 78,
B. R.-S. Cheo, E. E. Kunhardt, S. P. Kuo, and T. Q. Yip. Apr 79, 316p POLY-EE-79-053, AFOSR-TR-79-0752
Grant AFOSR-74-2668

Descriptors: Plasma waves, Electromagnetic radiation, Interactions, Stability, Nonlinear analysis, Decay schemes, Wave packets, Dispersing, Glow discharges, Parametric instabilities.
Identifiers: Bifurcation theory, Kortweg-de Vries equation, *Plasma electromagnetic interaction.

This is the final report on a variety of subjects in the non-linear interactions between electromagnetic fields and plasmas. Work includes both theoretical and experimental efforts. Principal results are: the first experimental verification of the existence of two distinct group velocities in a non-linear dispersive medium; and the development of a general vector theory of parametric excitation of plasma waves in a magnetized plasma. (Author)

AD-A071 099/6GA PC **A07**/MF **A01**
Naval Research Lab Washington DC
An MHD Instability Primer.
Interim rept.,
Wallace Manheimer, and Chris Lashmore-Davies. 29 Jun 79, 140p Rept no. NRL-MR-4000
Original contains color plates: All DDC and NTIS reproductions will be in black and white.

Descriptors: Magnetohydrodynamics, Plasmas(Physics), Magnetic fields, Tokamaks, Theory, Mathematical models, Equations, Stability, Toroids, Thermonuclear reactions.
Identifiers: Magnetohydrodynamic stability, *Plasma instability.

This report is a simple, self-contained treaties on MHD instabilities in plasmas. It is the result of a one year work assignment for one of us (WMM) at the Culham Laboratory in Abingdon, England. (Author)

CONF-790645-2 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Gas Injection in EBT-S for Assessment of Particle Loading Effects of Neutral Beam Injection.
K. H. Carpenter, and J. C. Glowienka. 1979, 20p
Contract W-7405-ENG-26
IEEE international conference on plasma science, Montreal, Canada, 4 Jun 1979.

Descriptors: *Elmo bumpy torus, ECR heating, Gas injection, *Neutral atom beam injection, Plasma, Wall loading.
Identifiers: ERDA/700104.

For abstract, see ERA citation 04:044076.

DOE/ET-0097 PC **A02**/MF **A01**
Department of Energy, Washington, DC. Office of Fusion Energy.
Trapped Particle Instabilities Workshop.
May 79, 20p

Descriptors: *Trapped-particle instability, Banana regime, Meetings, Nonlinear problems, Plasma instability, Research programs, Reviews, Transport theory.
Identifiers: ERDA/700107, Plasma microinstabilities.

For abstract, see ERA citation 04:045720.

LA-UR-79-1064 PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Flux Compression Generators as Plasma Compression Power Sources.
C. M. Fowler, R. S. Caird, D. J. Erickson, B. L. Freeman, and D. B. Thomson. 1979, 25p CONF-781247-1
Contract W-7405-ENG-36
International conference on energy storage, compression and switching, Venice, Italy, 5 Dec 1978.

Descriptors: Linear z pinch devices, *Magnetic compression, *Plasma focus devices, Plasma guns, Implosions, Liners, Magnetic flux, Plasma, Power supplies.
Identifiers: ERDA/700203, Theta pinch.

For abstract, see ERA citation 04:044130.

ORNL/TM-6820 PC **A03**/MF **A01**
Nagoya Univ. (Japan).
Electron Energy Confinement in ELMO Bumpy Torus (EBT).
S. Hiroe, G. R. Haste, and R. A. Dandl. Jun 79, 38p
Contract W-7405-ENG-26

Descriptors: *Elmo bumpy torus, *Plasma diagnostics, Collisionless plasma, Electron density, Electron temperature, Microwave radiation, Plasma confinement, Scaling laws, X-ray spectra.
Identifiers: ERDA/700101, ERDA/700102, Japan.

For abstract, see ERA citation 04:045695.

PPPL-1542 PC **A02**/MF **A01**
Princeton Univ., NJ. Plasma Physics Lab.
Toroidal Plasma Rotation in PLT Induced by Neutral Beam Injection.
S. Suckewer, H. P. Eubank, R. J. Goldston, and E. Hinnov. May 79, 18p
Contract EY-76-C-02-3073

Descriptors: Plasma, *PLT devices, Confinement time, Doppler effect, Neutral atom beam injection, Plasma confinement, *Plasma drift, Rotation, Spatial distribution.
Identifiers: ERDA/700104.

For abstract, see ERA citation 04:044080.

UCID-18181 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Computationally Convenient Criterion for Low-beta Interchange Stability of Tandem Mirrors.
T. B. Kaiser. 18 May 79, 8p
Contract W-7405-ENG-48

Descriptors: *Tmx devices, Aspect ratio, Computer calculations, Flute instability, Low-beta plasma, Magnetic field configurations.
Identifiers: ERDA/700107, *Magnetohydrodynamic stability.

For abstract, see ERA citation 04:044101.

UCRL-82272 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
LLL Dynamic High Pressure Experiments.
W. J. Nellis. Jan 79, 11p
Contract W-7405-ENG-48

Descriptors: *Plasma, Enthalpy, Equations of state, Implosions, Neodymium lasers, Reviews, Shock waves, Targets, Thermodynamics.
Identifiers: ERDA/700104.

For abstract, see ERA citation 04:039981.

20J. Quantum Theory

AD-A070 986/5GA PC **A02**/MF **A01**
Princeton Univ NJ Dept of Physics
Scaling Theory of Localization: Absence of Quantum Diffusion in Two Dimensions,
E. Abrahams, P. W. Anderson, D. C. Licciardello, and T. V. Ramakrishnan. 7 Dec 78, 5p
Contract N00014-77-C-0711
Prepared in cooperation with Rutgers - The State Univ., Piscataway, NJ. Serin Physics Lab. Pub. in Physical Review Letters, v42 n10 n673-676, 5 Mar 79.

Descriptors: Electrical conductivity, *Quantum theory, Electronic states, *Diffusion, Scaling factors, Reprints.

No abstract available.

AD-A071 100/2GA PC **A02**/MF **A01**
Massachusetts Inst of Tech Cambridge Lab for Information and Decision Systems
Filtering Theory and Quantum Fields.
Interim rept.,
Sanjoy K. Mitter. Apr 79, 8p LIDS-P-902, AFOSR-TR-79-0812
Grant AFOSR-77-3281
Presented at the Conference on Algebraic and Geometric Methods in Systems Theory held at Bordeaux, France, September 1979.

Descriptors: Quantum theory, *Mathematical filters, Kalman filtering, Hilbert space, Probability distribution functions, Bosons.
Identifiers: *Quantum field theory.

In this paper we describe certain remarkable connections that exist between mathematical developments in quantum field theory (and enclidean field theory) and filtering theory (and in general system theory). Roughly speaking, the Kalman filter is the mathematical analog of a free quantum field (in a precise sense) and the study of nonlinear filtering is the analog of the study of interacting quantum fields. Due to lack of space we only sketch this theory in this paper and the details of this work will be presented elsewhere. (Author)

20K. Solid Mechanics

AD-A070 810/7GA PC **A03**/MF **A01**
Grumman Aerospace Corp Bethpage NY Research Dept
Computer Techniques for Plasticity.
Research memo.,
H. Armen, and A. Pifko. Jun 79, 49p Rept no. RM-688J

Descriptors: *Plastic deformation, Algorithms, *Mathematical models, *Computerized simulation, Finite element analysis, Nonlinear systems, Deformation, Plastic flow, Metals, Nonmetals, Isotropism, Anisotropy.

Implicit in the development of any plasticity model are assumptions associated with the behavior of the actual material. Assumptions generally employed are listed with a discussion of their implications. Several models that incorporate these assumptions or attempt to overcome their restrictions are presented. Several alternative algorithms have evolved and are currently being used in finite element programs for plastic analysis. Each of these has computational advantages and liabilities so that the analyst is presented with choices among acceptable procedures. These procedures are reviewed in order to facilitate a rational selection among competing procedures that best suit the needs of a particular problem class. The contents of this memorandum will appear as a chapter in the ASME Pressure Vessel and Piping Division Vol. I - Decade of Progress in Design and Analysis (1980). (Author)

AD-A071 022/8GA PC **A03**/MF **A01**
Washington Univ St Louis MO Dept of Systems Science and Mathematics
The Constraint Method for Solid Finite Elements.
Annual technical rept. 1 Oct 77-30 Sep 78,
I. Norman Katz. Sep 78, 27p AFOSR-TR-79-0845
Grant AFOSR-77-3122

Descriptors: *Stress analysis, *Finite element analysis, Algorithms, Computer applications, Hierarchies, Elastic properties, Fracture(Mechanics), Loads(Forces).
Identifiers: Constraints.

In conventional approaches to finite element stress analysis accuracy is obtained by fixing the degree p of the approximating polynomial and by allowing the maximum diameter h of elements in the triangulation of approach zero. An alternate approach is to fix the triangulation and to increase the degree of approximating polynomials in those elements where more accuracy it is necessary to have a family of finite elements of arbitrary polynomial degree p with the property that as much information as possible can be retained from the pth degree approximation when computing the (p/l) st degree approximation. Comparison of the optimal beam (a variable-section beam) with a reference beam (a constant-section beam) shows that the weight reduction depends strongly on the frequency parameter beta. This weight reduction is negligible for beta approaching 0, is 11.3 per cent for beta = 1, is 55.3 per cent for beta = 1.4, and approaches 100 per cent for beta approaching 90 degrees. (Author)

CONF-790402-16 PC **A02**/MF **A01**
Foster Wheeler Energy Corp., Livingston, NJ.
Elastic-Plastic-Creep Analysis of Shells.
D. H. Pai. 1979, 23p
Contract EW-76-C-2395
Computational methods in nuclear engineering, Williamsburg, VA, USA, 23 Apr 1979.

Descriptors: Clinch River breeder reactor, *Heat exchangers, Lmfbr type reactors, Creep, *Shells, Stress analysis, Thermal stresses.
Identifiers: ERDA/210500.

For abstract, see ERA citation 04:042909.

NUREG/CR-0949 PC **A04**/MF **A01**
University of Southern California, Los Angeles. Dept. of Civil Engineering.
Analytical/Experimental Correlation of a Nonlinear System Subjected to a Dynamic Load.
Topical rept. 1 Oct 78-30 Sep 79,
J. C. Anderson, and S. F. Masri. Jul 79, 57p
Contract NRC-04-76-262

Descriptors: *Dynamic response, Nonlinear systems, Nuclear reactor safety, Piping systems, Dynamic structural analysis, Dynamic loads, Mathematical models, Experimental data.
Identifiers: One degree of freedom.

Analytical and experimental studies of the dynamic response of a system with geometric and material nonlinearity are described. The dynamic excitation consists of sinusoidal and impulsive base acceleration. The dynamic system, which is representative of many practical cases involving mechanical equipment and piping systems, including nuclear steam piping systems, consists of a cantilever beam with a gapped support at the free end. The material nonlinearity considers both the effect of yielding and the effect of strain rate on the initial yield level. The analytical studies are performed by transforming the continuous system to an equivalent single-degree-of-freedom system and using numerical techniques to solve the resulting equation of motion. Experimental studies are conducted and responses are measured on the same dynamic systems. Critical comparisons are made between the calculated and measured responses.

N79-28611/8GA PC **A12**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
The NASTRAN Demonstration Program Manual (Level 16.0).
Mar 76, 259p NASA-SP-224(03)

Descriptors: *NASTRAN, Problem solving, User manuals (Computer programs), Computer programming, Data processing, Finite element method, Input/output routines, Mathematical programming.

For abstract, see STAR 1719

N79-28613/4GA PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Possibilities and Limitations of Rod-Beam Theories.
D. Peterson. Jul 79, 38p NASA-TM-75466, DFVLR-FB-78-13
Contract NASW-3199
Tran-Transl. Into English of "Moeglichkeiten und Grenzen der Stabtheorien", Dfvlr-FB-78-13 Dfvlr, Brunswick, 1978 p 1-41. Subm-Transl. By Kanner (Leo) Associates, Redwood City, Calif.

Descriptors: *Beams (Supports), Deformation, Differential geometry, Nonlinearity, *Rods, Stress tensors, Bernoulli theorem, Displacement, Loads (Forces), Shear stress, Structural design.
Identifiers: Translations, *Mathematical models.

For abstract, see STAR 1719

WAPD-TM-1187 PC **A10**/MF **A01**
Bettis Atomic Power Lab., West Mifflin, PA.
MDSFP: A Computer Program for Elastic Solution of Three Dimensional Structures by the Finite Element Method (LWBR Development Program).
R. M. Clark. Feb 79, 209p
Contract EY-76-C-11-0014

Descriptors: Computer codes, *Lwbr type reactors, *Reactor cores, Finite element method, Hydraulics, M codes, Pressure gradients, Stress analysis, Temperature gradients, Three-dimensional calculations.
Identifiers: ERDA/210500, *MDSFP computer program, Structural analysis.

For abstract, see ERA citation 04:042925.

20L. Solid-State Physics

AD-A070 533/5GA PC **A02**/MF **A01**
Army Armament Research and Development Command Watervliet NY Benet Weapons Lab
Magnetic Moment of Pressure Quenched Cadmium Sulfide.
Technical rept.,
C. G. Homan, D. P. Kendall, and R. K. Maccrone. May 79, 18p ARLCB-TR-79006, AD-E440 029

Descriptors: *Cadmium sulfides, Paramagnetism, Polycrystalline, Phase transformations, Anomalies, Quenching, High pressure, *Magnetic moments, Diamagnetism, Semiconductors, Magnetic properties, Magnetometers.

Magnetic moment measurements of cadmium sulfide (CdS) polycrystalline samples, pressure quenched from above the semi-conducting to conducting transition pressure (40 kbars) at rates approaching 1000000 bars/sec, have been made in a vibrating sample magnetometer to fields approaching 1000 Oersted. The samples exhibit the complex magnetic behavior of low field diamagnetism transforming at fields of several hundred Oersted to positive magnetism.

AD-A070 658/0GA Not available NTIS
Illinois Univ at Urbana-Champaign Materials Research Lab
Compound Semiconductors,
N. Holonyak, Jr., G. E. Stillman, and C. M. Wolfe. 1978, 13p
Prepared in cooperation with Washington Univ., St. Louis, MO. Dept. of Electrical Engineering.
Availability: Pub. in Jnl. of the Electrochemical Society, v125 n12 p487C-499C Dec 78. (No copies furnished by DDC).

Descriptors: *Semiconductors, Epitaxial growth, Molecular beams, Vapor phases.
Identifiers: Gallium arsenide phosphides, Reprints.

No abstract available.

AD-A070 679/6GA PC **A02**/MF **A01**
Honeywell Corporate Technology Center Bloomington MN
Resonant 4-Photon and Higher Order Mixing in Hg(0.77)Cd(0.23) Te,
M. A. Khan, P. W. Kruse, and J. F. Ready. 18 Sep 78, 6p AFOSR-TR-79-0664
Contract F49620-77-C-0028
Pub. in Optics Communications, v28 n3 p374-378 Mar 79.

Descriptors: *Electrooptics, Laser pumping, Mercury alloys, Semiconductors, Cadmium, Tellurium, Carbon dioxide lasers, Infrared lasers, Photons, Reprints.
Identifiers: *Cadmium mercury tellurides.

No abstract available.

AD-A070 690/3GA PC **A02**/MF **A01**
Army Armament Research and Development Command Watervliet NY Benet Weapons Lab
Acoustic Velocity Ratios in Solid Argon at 75 K up to Static Pressures of 150 Kbar.
Technical rept.,
C. G. Homan, J. Frankel, D. P. Kendall, J. A. Barrett, and T. E. Davidson. 1979, 13p ARLCB-TR-79005, AD-E440 030
Presented at the AIRAPT International High Pressure Conference (6th), Boulder, CO., Jul 77. Pub. in High-Pressure Science and Technology, v1 p339-346 1979.

Descriptors: *Argon, Cryogenics, Ultrasonic properties, *Acoustic velocity, Phase transformations, Polymorphism, High pressure, Static pressure, Equations of state, Calibration, Metastable state, Bismuth, Specific heat, Compressive properties, Interferometry, Reprints.
Identifiers: Solids.

The ratio of longitudinal to shear ultrasonic velocities in solid Ar has been measured by an interferometric technique in a variably supported Bridgeman anvil device. Pressure was determined by the simultaneous measurement of the polymorphic phase transitions of a Bismuth sample imbedded in the Ar. The 75 deg K isotherm of the equation of state of Ar was calculated and is compared to earlier experimental results below 20 kbar and the 0 deg K EOS suggested by Anderson ad Swenson to 100 kbar.

AD-A070 740/6GA PC **A07**/MF **A01**
Rockwell International Anaheim CA
Exploratory Development on Silicon Material for LADIR.
Final rept. 1 Aug 75-30 Sep 77,
M. C. Arst. Sep 77, 134p C77-239/034A, AFML-TR-76-125
Contract F33615-76-C-5024

Descriptors: *Infrared detectors, *Forward looking infrared systems, *Silicon, Crystal growth, Purity, Doping, Gallium, Polycrystalline, Boron, Test and evaluation, Antimony, Microelectronics.

This report contains a background description of the program, an evaluation of test approaches, test results, and a description of the process which has been developed to produce silicon material which meets the requirements of the contract. Where applicable, these subjects are discussed under the following tasks: Task I, Purification of Intrinsic Silicon; Task 2, Growth of Doped Silicon Crystals; Task 3, Crystal Material Evaluation; and Task 4, Definition of Growth Process. A major conclusion of the program is that the most suitable counter dopant for the residual boron concentration is antimony (Sb). This impurity has characteristics that are compatible with the other impurities in the material and remains stable during the on-chip microelectronics processing. In addition, it is easy to introduce into the silicon ingot during the doping process and distributes evenly over the bulk.

AD-A070 792/7GA PC **A03**/MF **A01**
Minnesota Univ Minneapolis Dept of Electrical Engineering
A Study of Metal-Semiconductor Contacts on Indium Phosphide.
Final technical rept. 1 Aug 77-30 Sep 78,
G. Y. Robinson. May 79, 50p RADC-TR-79-113
Contract F19628-77-C-0204

Descriptors: *Indium phosphides, *Schottky barrier devices, *Electric contacts, Metal films, Semiconductors, Interfaces, Auger electron spectroscopy, Nickel, Gold, Germanium.
Identifiers: Schottky diodes.

This report describes the research accomplished during a 14-month program of research on metal-semiconductor contacts on indium phosphide. Emphasis was placed on fabrication and characterization of ohmic contacts to p- and n-type InP using the deposition of thin metallic layers and subsequent heat treatment at elevated temperatures. Extensive use of Auger electron spectroscopy (AES) was made in order to obtain depth-composition profiles of the thin-film structures. For contact to n-type InP, three thin-film systems were investigated: Au, Ni, and a composite layer of Ni/Au/Ge. The specific contact resistance (r sub c) of the Ni/Au/Ge/In system varied in a systematic manner with heat-treatment temperature, and a minimum value of r sub c of .00003 ohm-sq cm at 325 C was found for N(D) = 3 x 10 to the 16th power/cc. Several nickel germanide phases, detected by AES and X-ray diffraction, were formed during heat treatment and were found to affect r sub c. For contact to p-type InP, a film consisting of Au/Mg was investigated. For heat treatment of the Au/Mg/InP system above 350 C, r sub c decreased with increasing signs of alloying at higher temperatures. The smoothest surface was obtained at 446 C for 50 minutes with r sub c approx. 0.0001 ohm/sq cm for N(A) = 6 x 10 to the 17th power/cc.

AD-A070 805/7GA PC **A02**/MF **A01**
National Bureau of Standards Boulder CO Time and Frequency Div
Summary of Work on Cooled Ion Frequency Standard.
Annual rept. Sep 78-Aug 79,
D. J. Wineland, and F. L. Walls. 15 Jun 79, 6p
Contract N00014-77-F-0046

Descriptors: *Atomic spectroscopy, *Ions, *Cooling, *Laser beams, Doppler effect, Frequency, Magnesium, Solid state electronics.
Identifiers: Cryogenics.

The purpose of this work is to develop techniques to overcome the fundamental limits of present fre-

quency standards--the second and residual first-order Doppler shifts. To this end we study suitable frequency reference transitions in ions which are stored in electromagnetic traps and cooled by radiation pressure to < 1K. (Author)

AD-A070 807/3GA PC **A03**/MF **A01**
Princeton Univ NJ Dept of Physics
Excitations and Metastability in Amorphous Semiconductors,
D. C. Licciardello, D. L. Stein, and F. D. M. Haldane. 28 Jun 79, 29p
Contract N00014-77-C-0711, Grant NSF-DMR78-03015

Descriptors: Amorphous materials, Semiconductors, Mathematical models, Glass, Diamagnetism, Equilibrium(General), Thermodynamics, Phonons, Entropy, Fermi surfaces.
Identifiers: *Amorphous semiconductors, Anderson model.

The Anderson negative-U model for diamagnetic glasses is studied. The optical and thermodynamic excitations are evaluated for equilibriated and non-equilibriated systems. The model is generalized to include non-local phonons and these are shown to lead to new low energy processes which may be important for thermodynamic properties. (Author)

AD-A070 809/9GA PC **A02**/MF **A01**
Colorado State Univ Fort Collins Dept of Physics
Depth and Carrier Concentration of Photoluminescence Features in Heat Treated GaAs:Si.
Technical rept.,
Hulya Birey, and James Sites. May 79, 17p Rept no. SF22
Contract N00014-76-C-0976

Descriptors: *Gallium arsenides, Doping, Silicon, *Photoluminescence, Annealing, Depth, Profiles, N type semiconductors.

The photoluminescence (PL) spectra of silicon doped n-type GaAs of four different carrier concentrations from 4 x 10 to the 15th power to 3 x 10 to the 18th power/cc were examined. Successive measurements as the samples were annealed for times from 15 to 60 minutes at 600-700 C, and as they were successively etched back, revealed that all PL changes were surface related, with a typical depth of 1 micron. (Author)

AD-A070 866/9GA PC **A02**/MF **A01**
Colorado State Univ Fort Collins Dept of Physics
Photoluminescence of Gallium Arsenide Encapsulated with Aluminum and Silicon Nitride Films.
Technical rept.,
Hueiya Birey, Sung-Jae Pak, and J. R. Sites. May 79, 14p Rept no. SF23
Contract N00014-76-C-0976

Descriptors: *Gallium arsenides, Encapsulation, Silicon nitrides, Aluminum compounds, Nitrides, Ion beams, Sputtering, Annealing, High temperature, *Photoluminescence, Doping, Impurities.

Aluminum and silicon nitride films were deposited on lightly doped n-type GaAs:Si by low energy ion beam sputtering. The films showed no signs of deterioration when annealed at 900 C, and the GaAs photoluminescence spectra showed new features only at the higher annealing temperatures. (Author)

AD-A070 927/9GA PC **A02**/MF **A01**
Princeton Univ NJ Dept of Physics
Optical Versus Transport Processes in Chalcogenide Glasses,
D. C. Licciardello, and D. L. Stein. 28 Jun 79, 12p
Contract N00014-77-C-0711, Grant NSF-DMR78-03015

Descriptors: Amorphous materials, Semiconductors, *Chalcogens, *Glass, Optical properties, Transport properties, Mathematical models, Paramagnetic resonance, Metastable state, Arsenic compounds, Selenides.

A model for amorphous chalcogenide semiconductors predicts an intrinsic photoinduced paramagnetic band of metastable states which may absorb light and give rise to an electron spin resonance. It is shown that these centers are unrelated to those responsible for limiting carrier mobility in accord with recent experiments on doped a - As2Se3. (Author)

AD-A070 932/9GA PC **A03**/MF **A01**
Hughes Research Labs Malibu CA
Silicon-Germanium Alloys for Infrared Detectors.
Interim rept. 15 Aug 77-15 Aug 78,
H. Winston, and H. Kimura. Apr 79, 36p AFML-TR-79-4043
Contract F33615-77-C-5052

Descriptors: Infrared detectors, *Silicon alloys, *Germanium alloys, Czochralski crystals, Crystal growth, Radiation absorption, Laser beams, Neodymium lasers, Stoichiometry.
Identifiers: Silicon alloy 10Ge.

Silicon-germanium alloys in the range of 10 at .% germanium have been prepared and investigated. The object of the program is to prepare intrinsic Si-Ge with high enough absorption at 1.06 micrometers to be suitable for detectors at that wavelength and to investigate whether the changes in energy levels and optical properties of doped Si-Ge offer advantages for monolithic focal plane array applications over the corresponding doped silicon. The first year's work concentrated mostly on growing intrinsic material. After some attempts to prepare crystals by growing a succession of seeds of increasing Ge content, we found that alloys with greater than 10% Ge could be grown by the Czochralski technique directly from 0.5% (or even 0%) Ge seeds if a suitable growth rate was chosen. The necessary slow growth rate to achieve single crystals necessitated long exposures of the melt to contamination from the crucible, but the use of high-purity synthetic quartz crucibles reduced the uptake of electrically active impurties. Measurements on alloys that were not intentionally doped yielded values for the shift in the energy level of boron from the case of a pure silicon host that were in agreement with the literature.

AD-A070 990/7GA PC **A03**/MF **A01**
Rensselaer Polytechnic Inst Troy NY Dept of Mechanical Engineering Aeronautical Engineering and Mechanics
The Growth of Wave Discontinuities in Piezoelectric Semiconductors.
Technical rept.,
M. F. McCarthy, and H. F. Tiersten. Jun 79, 36p Rept no. TR-28
Contract N00014-76-C-0368, Grant NSF-ENG72-04223
Prepared in cooperation with National Univ., of Ireland, Galway.

Descriptors: *Piezoelectric materials, Semiconductor devices, Nonlinear propagation analyses, Electroacoustics, Lattice dynamics, Acoustic waves, Eigenvectors, Discontinuities, Stress waves, Maxwells equations.
Identifiers: Electric fields.

The reference coordinate description of the general nonlinear differential equations describing the interaction of finitely deformable, polarizable, intrinsic n-type semiconductors with the quasi-static electric field is applied in the study of acceleration waves in piezoelectric semiconductors. As a consequence, the mechanical and dielectric nonlinearities are included in the treatment as well as the semiconduction nonlinearity. The general equation for the propagation velocity of the disturbance is obtained as a function of the state of the material immediately ahead of the wavefront. In the special case of plane waves entering a homogeneous steady state, the growth equation for the amplitude of the acceleration wave is determined and, of course, the propagation velocity and coefficients in the growth equation depend on the propagation direction, but otherwise are constant. The relation between acceleration waves and the formation and propagation of acoustoelectric domains is indicated. The solutions of the growth equation indicate the formation of a shock in a finite time for conditions conducive to domain formation except in certain unusual cases possibly occurring with purely transverse acceleration waves. In the course of the treatment the condition for the threshold field for domain formation is determined under quite general circumstances.

AD-A071 039/2GA PC **A03**/MF **A01**
Colorado State Univ Fort Collins Dept of Physics
Radiative Transitions Induced in GaAs by Modest Heat Treatment.
Technical rept.,
Hueiya Birey, and James Sites. Apr 79, 27p Rept no. SF20
Contract N00014-76-C-0976

Descriptors: *Gallium arsenides, Annealing, *Photoluminescence, Doping, Silicon, Tellurium, Transitions.

Photoluminescence studies were made on three species of GaAs as a function of annealing time. The evolution of the spectra were carefully monitored and interpreted in terms of the creation of arsenic vacancies at the surface. (Author)

AD-A071 059/0GA PC **A02**/MF **A01**
Illinois Univ at Urbana-Champaign Dept of Electrical Engineering
The Study and Identification of Residual Donor Species in High Purity Semiconductors.
Final rept. 1 Jun 78-31 May 79,
Gregory E. Stillman. May 79, 24p Rept no. UILU-ENG-79-2553
Contract N00173-78-C-0129

Descriptors: *Impurities, *Semiconductors, Fourier spectroscopy, Indium phosphides, Electron donors, Electron energy, Energy levels, Cryostats, Fourier transformation, Photothermal properties, Ionization, Data acquisition.

A Fourier transform spectroscopy apparatus has been constructued. This apparatus uses photothermal ionization to probe the energy level structure of shallow impurities in semiconductors. The present form of the apparatus, and progress made in modifying it to increase its resolution are described in detail. An account of our immediate and possible furture applications of the apparatus is given. (Author)

AD-A071 094/7GA PC **A08**/MF **A01**
Honeywell Electro-Optics Center Lexington MA
Minority Carrier Lifetime and Diffusion Length in P-Type Mercury Cadmium Telluride.
Final technical rept. Aug 77-Jan 79,
Joseph L. Schmit, Stephen P. Tobin, and Timothy J. Tredwell. Feb 79, 153p AFML-TR-79-4036
Contract F33615-77-C-5142
Prepared in cooperation with Honeywell Corporate Material Sciences Center, Bloomington, MN.

Descriptors: Photodiodes, Cadmium tellurides, Mercury compounds, *Charge carriers, *Diffusion, Preparation, Materials, Crystal growth, Measurement, Life expectancy, Annealing, Charge density, Holes(Electron deficiencies), Semiconductor diodes, Theory, Mercury alloys, Epitaxial growth, Radiative transfer, Fabrication.
Identifiers: Minority carriers(Electronics), *Cadmium mercury tellurides.

This report covers a study of the relationship between minority carrier properties and majority carrier hole and acceptor concentrations. This report documents the following conclusions: The dominant recombination mechanism is Shockley-Read not radiative. The recombination center is at 140 meV above the valence band edge and has a concentration proportional to the acceptor concentration.

AD-A071 166/3GA PC **A04**/MF **A01**
RCA Labs Princeton NJ
Epitaxial Growth of Semi-Insulating GaAs.
Interim rept. 1 Jul 78-31 Mar 79,
S. T. Jolly, E. C. Douglas, S. G. Liu, C. P. Wu, and Y. H. Yun. May 79, 59p Rept no. PRRL-79-CR-20
Contract N00014-77-C-0542, DARPA Order-3441

Descriptors: *Epitaxial growth, *Gallium arsenides, Insulation, Chromium, Doping, Layers, Annealing, Measurement, Ion implantation, Chemical reactors, Crystal lattices, Vapor phases, Experimental data, Crystal growth, Lasers, Crystal defects.

The objectives of this program are to (1) develop techniques for the epitaxial growth of high-resistivity buffer layers on semi-insulating (SI) GaAs substrates, (2) investigate ion implantation of donors into GaAs over a range of 50 to 2000 keV, and (3) investigate the potential of laser annealing to

remove lattice damage caused by ion implantation and to activate the implanted donors. Preliminary results on growth of Cr-doped buffer layers by vapor-phase epitaxy (VPE) were described in our previous report. These Cr-doped layers were grown using the Ga/HC1/AsH3/H2 system. Based on these results specifications for a new semi-automatic gas-handling system were developed and the unit purchased from Crystal Specialties.

AD-A071 168/9GA PC **A06**/MF **A01**
Massachusetts Inst of Tech Lexington Lincoln Lab
Orientation of Crystalline Overlayers on Amorphous Substrates by Artificially Produced Surface Relief Structures.
Technical rept.,
Dale C. Flanders. 5 Dec 78, 113p TR-533, ESD-TR-78-294
Contract F19628-78-C-0002, ARPA Order-3336

Descriptors: *Crystals, Single crystals, Liquid crystals, Epitaxial growth, Thin films, Substrates, Overlays, *Amorphous materials, Polycrystalline, Orientation(Direction), Anisotropy, Surfaces.

A new method of orienting crystalline (anisotropic) overlayers on an amorphous substrate by surface relief structures on the substrate has been analyzed and demonstrated. New submicrometer fabrication techniques has to be developed in order to demonstrate the orientation effect. These techniques may have broad application in the field of microelectronics and integrated optics as well as in the work presented here. It is believed that the models and demonstrations of overlayer orientation presented here are but a first step in what will be an exciting new field of investigation. In essence, a new degree of freedom has been introduced in the science and technology of surfaces and thin-film growth.

BNL-26099 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Single Particle Excitations in RbAg sub 4 I sub 5.
S. M. Shapiro, and M. B. Salamon. 1979, 9p
CONF-790538-4
Contract EY-76-C-02-0016
Fast ion transport in solids-electrode and electrolytes conference, Lake Geneva, WI, USA, 21 May 1979.

Descriptors: *Rubidium iodides, *Silver iodides, Excitation, Inelastic scattering, Ionic conductivity, Lattice parameters, Phase transformations, Temperature dependence.
Identifiers: ERDA/360602, ERDA/360603, ERDA/360605.

For abstract, see ERA citation 04:043476.

CONF-781076-2 PC **A02**/MF **A01**
Oak Ridge National Lab., TN.
Effect of Laser Annealing on the Redistribution of Boron in Ion Implanted and Boron Deposited Silicon.
W. H. Christie, and C. W. White. 1978, 8p
Contract W-7405-ENG-26
US-Japan seminar on SIMS, Osaka, Japan, 23 Oct 1978.

Descriptors: *Silicon, Ion implantation, *Boron, Doped materials, Fabrication, Laser radiation.
Identifiers: ERDA/360601, Semiconductor doping, Boron additions, Ruby lasers, Normal density functions.

For abstract, see ERA citation 04:027280.

COO-2305-6 PC **A04**/MF **A01**
Connecticut Univ., Storrs. Inst. of Materials Science.
Electron-Dislocation Interaction at Low Temperatures. Progress Report.
1978, 57p
Contract EY-76-S-02-2305

Descriptors: *Aluminium, *Copper, *Type-II superconductors, *Dislocations, Indium alloys, Lead base alloys, Magnetic fields.
Identifiers: ERDA/360105.

For abstract, see ERA citation 04:041268.

IS-Trans-106 PC **A02**/MF **A01**
Theory of Interstitial Ordering in Alloys with Hexagonal Close-Packed Crystal Lattice.
V. N. Bugaev. 1978, 14p VAAP-00-2
Contract W-7405-ENG-82
A, Ukr. Fiz. Zh. (Russ. Ed.), 23 n7 P1073-1080 1978.

Descriptors: *HCP lattices, Cobalt, Hafnium, Impurities, Interstitials, Iron, Metals, Solid solutions, Tantalum, Titanium-alpha, Tungsten, Zirconium.
Identifiers: ERDA/656000, ERDA/360102, Translations, USSR, *Alloys, Hexagonal lattices, Crystal lattices.

For abstract, see ERA citation 04:044055.

N79-28285/1GA PC **A02**/MF **A01**
Harvard Univ., Cambridge, MA. Div. of Applied Sciences.
Crystal Nucleation in Glass-Forming Alloy and Pure Metal Melts under Containerless and Vibrationless Conditions.
Annual Summary.
D. Turnbull. Jun 79, 5p NASA-CR-161267
Contract NAS8-32691

Descriptors: Containerless melts, *Crystal growth, Nucleation, Liquid metals, *Metallic glasses, Quenching (Cooling).

For abstract, see STAR 1719

N79-28287/7GA PC **A06**/MF **A01**
Rensselaer Polytechnic Inst., Troy, NY.
Diffusion and Phase Change Characterization by Mass Spectrometry.
Final Report.
M. E. Koslin, and F. A. White. Aug 79, 111p
NASA-CR-3165
Grant NSG-1360

Descriptors: Allotropy, High temperature tests, Mass spectroscopy, *Phase transformations, *Thermal diffusion, Trace elements, Crystallography, Impurities, Ionization, Ribbons, Stainless steels, Tantalum, Zircaloy 2 (Trademark).
Identifiers: Stainless steel-304, Metals, Alloys.

For abstract, see STAR 1719

N79-28316/4GA PC **A05**/MF **A01**
Georgia Inst. of Tech., Atlanta.
Surface Temperatures and Glassy State Investigations in Tribology, Part 2.
Final Report.
S. S. Bair, and W. O. Winer. Jul 79, 80p NASA-CR-3162
Grant NSG-3106

Descriptors: *Glass, *Lubricants, Surface temperature, Tribology, Elastic properties, Elastohydrodynamics, Maxwell equation, Maxwell fluids, Plastic properties, Pressure distribution, Rheology, *Shear stress, Viscosity.
Identifiers: Amorphous state, Melting, Freezing.

For abstract, see STAR 1719

N79-28418/8GA PC **A10**/MF **A01**
Science Applications, Inc., Vienna, VA. Radiation and Electromagnetics Div.
First Principles Numerical Model of Avalanche-Induced Arc Discharges in Electron-Irradiated Dielectrics.
Final Report, Jul. 1978 - Feb. 1979.
B. L. Beers, V. W. Pine, H. C. Hwang, H. W. Bloomberg, and D. L. Lin. Mar 79, 203p NASA-CR-159560, SAI-102-79-002
Contract NAS3-21378

Descriptors: *Arc discharges, *Dielectrics, Electron irradiation, *Mathematical models, Algorithms, Electric discharges, Electrical faults, Graphs (Charts), Numerical analysis, Spacecraft charging, Tables (Data), Teflon (Trademark).
Identifiers: Computer programs, Avalanche breakdown.

For abstract, see STAR 1719

PB-298 662/8GA Not available NTIS
National Bureau of Standards, Washington, DC.
Effect of Bound Hole Pairs on the d-band Photoemission Spectrum of Ni.
Final rept.,
David R. Penn. 2 Apr 79, 5p
Pub. in Physical Review Letters 42, n14, p921-925, 2 Apr 79.

Descriptors: *Nickel, *Holes(Electron deficiencies), Band structure of solids, Emission spectra, Photoelectric emission.
Identifiers: Reprints.

It is shown that the spectral density of the Ni d electrons contains a peak due to excitations of bound hole pairs. The spectral density is observed directly in photoemission experiments which show a satellite peak below the bottom of the d bands. The observed peak exhibits a strong resonance as a function of photon energy and this behavior is also explained by the present theory.

PB-298 755/0GA Not available NTIS
National Bureau of Standards, Washington, DC.
Electrical Characterization of Low-Dose Ion-Implanted Silicon Annealed with Microsecond Laser Pulses.
Final rept.,
D. R. Myers, P. Roitman, and S. Mayo. 1979, 6p
Sponsored in part by Advanced Research Projects Agency, Arlington, VA.
Pub. in Proceedings American Inst. of Physics Conf. (50th), Held at Boston, MA. on Nov 27-Dec 1, 1978. Paper in Laser-Solid Interactions and Laser Processing, p563-568, 1978.

Descriptors: *Silicon, Annealing, Laser beams, Semiconductor doping, Boron, Phosphorus, Electrical properties.
Identifiers: Dye lasers, Ion implantation, Boron ions, Phosphorus ions.

Silicon wafers implanted with low doses (about 10 to the 12th power/sq cm) of either boron or phosphorous ions were annealed with a dye laser and the results compared to those obtained from identically implanted, thermally annealed wafers. The laser was tuned to a wavelength of 600 nm and had a pulse duration of 1 microsecond with a roughly triangular waveform peaked at approximately 230 ns. Energy densities of the laser pulse were varied from 0.7 J/sq cm to 2.8 J/sq cm in five stages. The thermal anneals were performed at 700C or 800C for 30 min in dry nitrogen. Examination of electrical activation of the annealed areas using capacitance-voltage (C-V) profiling on Schottky barrier structures indicated significant boron activation for the laser-annealed areas, with peak dopant concentrations 25 to 100% of those obtained from thermal annealing alone.

PB-298 801/2GA Not available NTIS
National Bureau of Standards, Washington, DC.
Ground State of f.c.c. Alloys with Multiatom Interactions.
Final rept.,
John W. Cahn, and Ryoichi Kikuchi. 1979, 8p
Sponsored in part by Army Research Office, Washington, DC.
Pub. in Acta Met. 27, p1329-1336 1979.

Descriptors: *Face centered cubic lattices, Ground state, Atoms, Interactions, Free energy.
Identifiers: *Binary alloy systems, Interaction range, Chemical potential, Reprints.

The ground state of a binary f.c.c. alloy with nearest neighbor interactions and tetrahedral multiatom interactions (characterized by two parameters alpha and beta) is derived and presented in a chart which shows classification of phases in the space of alpha and beta. Where non-stoichiometric phases can occur, the phase boundaries at T = 0 are computed using the tetrahedron approximation of the cluster variation method. Duality of the composition and the chemical potential is emphasized and results are presented and/or interpreted in the dual approaches.

SAN-2215-T1 PC **A02**/MF **A01**
Connecticut Yankee Atomic Power Co., East Hampton.
Electrodeposited Amorphous Silicon for Solar Applications. First Quarterly Progress Report, 15 September 1978--15 December 1978.
A. E. Austin. 15 Dec 78, 12p
Contract ET-78-C-03-2215

Descriptors: *Silicon, Silicon solar cells, Amorphous state, Boron bromides, Chlorine, Crystal

doping, Electrodeposited coatings, Electrodeposition, Fabrication, Gallium, Selenium chlorides.
Identifiers: ERDA/140501, ERDA/360601, *Semiconductor doping.

For abstract, see ERA citation 04:036045.

SAND-78-1436C PC **A02**/MF **A01**
Sandia Labs., Albuquerque, NM.
Continuum Theory for Localized Heating in Granular Materials.
J. W. Nunziato, and E. K. Walsh. 1978, 3p
CONF-781206-1
Contract EY-76-C-04-0789
15. meeting of Society of Engineering Science, Gainesville, FL, USA, 4 Dec 1978.

Descriptors: Reactor materials, Heat transfer.
Identifiers: ERDA/360602, *Granular materials, Theory, Continuum mechanics, Deformation, Heating.

For abstract, see ERA citation 04:027284.

20M. Thermodynamics

AD-A070 900/6GA PC **A02**/MF **A01**
California State Univ Long Beach Dept of Mechanical Engineering
Heat Transfer from a Circular Cylinder Impulsively Started from Rest,
Tuncer Cebeci. 1978, 14p
Contract N00014-77-C-0156
Pub. in Numerical Heat Transfer, v1 p557-567 1978.

Descriptors: *Heat transfer, Boundary layer, Impulse loading, Boundary layer flow, Flow separation, Nonuniform flow, Numerical methods and procedures, Reprints.
Identifiers: *Cylinders.

No abstract available.

AD-A071 096/2GA PC **A02**/MF **A01**
Delaware Univ Newark Applied Mathematics Inst
The Approximation of Solutions to the Backwards Heat Equation by Solutions of Pseudoparabolic Equations.
Interim rept.,
David Colton. 1979, 14p AFOSR-TR-79-0814
Grants AFOSR-76-2879, NSF-MCS578-02452

Descriptors: *Heat transfer, *Partial differential equations, Boundary value problems, Potential theory, Eigenvalues, Banach space.
Identifiers: Initial value problems, Pseudoparabolic differential equations.

It is well known that solutions of the backwards heat equation can be approximated by solutions of a pseudoparabolic equation depending on a small parameter (epsilon). The emphasis in this paper is on the mathematical problems which arise in approximating solutions to initial-boundary value problems for this perturbed equation. The approximation procedure we propose is obtained through the development of a potential theory for pseudoparabolic equations, the asymptotic evaluation of certain contour integrals, and results based on a theorem of Levin in the theory of entire functions. (Author)

N79-28313/1GA PC **A02**/MF **A01**
Royal Aircraft Establishment, Farnborough (England).
Studies in the Glass Transition Region of Acrylonitrile-Isobutylene Copolymers.
J. Ritter, and E. Helm. Jan 79, 17p RAE-LIB-TRANS-1996, BR68216
Tran-Transl. into English from Plaste Kaut. (Germany, F.R.), V. 25, No. 1, 1978 p 5-8.

Descriptors: *Copolymers, Specific heat, Transition temperature, *Acrylonitriles, Butenes, Cohesion.
Identifiers: Translations, *Propane/methyl, *Glass transition temperature.

For abstract, see STAR 1719

PB-298 652/9GA Not available NTIS
National Bureau of Standards, Washington, DC.
Measurements of Axial Heat Transport in Helium II with Forced Convection.
Final rept.,
W. W. Johnson, and M. C. Jones. 1978, 8p
Pub. in Proceedings of the International Cryogenic Materials Conference (2nd) Held at Boulder, CO. on August 3-5, 1977, p363-370, 1978.

Descriptors: *Superfluidity, *Liquid helium, Convection, Liquid flow, Heat transfer.
Identifiers: *Helium II.

An experiment was performed that allowed measurements of the effect of forced convection on the axial heat transport of He-II contained in a long tube. The apparatus allowed the pressure difference and temperature difference across the tube to be adjusted independently, and both the resulting heat flow and net fluid flow to be measured. The two-fluid model can be used to display the separate contributions of 'internal convection' and ordinary convection to the heat transport. The results show that, in the limit of large temperature differences and fluid velocities, the behavior is approaching that of a classical fluid; this allows the extrapolation of these results, with reasonable confidence, to conditions (suitable for some applications) where forced convection would allow at least ten times the heat transport of 'internal convection' alone.

PB-298 800/4GA Not available NTIS
National Bureau of Standards, Washington, DC.
Magnetic Field Effect on Thermal Conductivity of Selected Metals.
Final rept.,
L. L. Sparks. 1978, 7p
Sponsored in part by Advanced Research Projects Agency, Arlington, VA.
Pub. in Proceedings of Int. Cryogenic Materials Conference (2nd), Boulder, CO., August 3-5, 1977, Paper D-2 in Advances in Cryogenic Engineering, 24, p224-231 1978.

Descriptors: *Alloys, *Metals, *Thermal conductivity, Magnetic fields, Copper, Aluminum containing alloys, Iron alloys, Nickel alloys, Stainless steels, Titanium alloys, Vanadium containing alloys, Ferronickel.
Identifiers: Temperature dependence, Ultralow temperature, Very low temperature, Titanium alloy 6Al 4V, Steel 310, Steel 304.

The behavior of thermal conductivity in the presence of magnetic fields has been experimentally determined for eight alloys and for two copper specimens (RRR = 107 and 1520). The data were taken for 0 = or < H = or < 6366 kA/m (80 k0e) and 5 = or < T = or < 20K. A summary of results is presented which indicates that (1) the decrease in conductivity is large (up to 80%) for the copper specimens and somewhat smaller (up to 50%) for aluminum alloy, (2) the Fe-Ni alloys are only slightly affected (up to 8%), (3) the effect on stainless steel S31000 (AISI 310) is approximately twice that of S30400 (AISI 304), and (4) the Ti-6Al-4V alloy shows a reasonably small percentage effect, but the largest difference with temperature of all of the materials tested. The relative importance of the magnetothermal effect compared to that of thermal history and material variability is discussed.

UCRL-81974 PC **A03**/MF **A01**
California Univ., Berkeley. Lawrence Berkeley Lab.
LIEPROC: A MACSYMA Program for Finding Adiabatic Invariants of Simple Hamiltonian Systems Via the Lie Transform.
B. Char, and B. McNamara. 22 Nov 78, 38p
CONF-790629-1
Contract W-7405-ENG-48
MACSYMA users conference, Washington, DC, USA, 20 Jun 1979.

Descriptors: Computer codes, *Hamiltonians, Plasma, *Adiabatic invariance, Equations of motion, Hamiltonian function, Kinetics, L codes, Lie groups, PDP computers, Perturbation theory, Plasma confinement, Plasma heating.
Identifiers: ERDA/990200, ERDA/700103, *Lie transformation, *LIEPROC computer program, Symbolic programming, MACSYMA programming language.

For abstract, see ERA citation 04:044187.

20N. Wave Propagation

AD-A070 531/9GA PC **A07**/MF **A01**
Debettencourt (Joseph T) Newton MA
Lithospheric Radio Propagation Modelling a Feasibility Study.
Final rept. 1 Sep 78-28 Feb 79,
Joseph T. deBettencourt, and Ronald W. P. King. Apr 79, 138p Rept no. DBK-2
Contract N00014-78-C-0668

Descriptors: Lithosphere, *Radio transmission, Waveguides, Electrical conductivity, Attenuation, Oceans, Sea water, Electric fields, Models.

Radio wave propagation in the earth's crust is reviewed. This has been studied by many investigators who usually assume the crust to be a planar slab of low loss-tangent, bounded on top and bottom by regions of large loss-tangent. Available conceptual depth profiles of complex dielectric constant of the lithospheric waveguide are reviewed and theories extant summarized. Sources were usually VED's inserted through vertical boreholes. For ocean emplaced antennas located near the ocean-lithosphere boundary, the sources are horizontally polarized and propagation is predominantly by means of lateral waves. Calculations are reported for a wide range of conditions. The useful characteristics of lateral wave transmission are discussed. The measured properties of scaled waveguide propagation that have been reported could not accurately scale the losses in the overburden since it was represented by a metal plate. The principles of electrodynamic similitude are delineated and two different experiments using similitude with different depth profiles are discussed.

AD-A070 599/6GA PC **A02**/MF **A01**
Maryland Univ College Park Dept of Physics and Astronomy
Nonlinear Development of the Negative-Mass Instability and Its Effect on Intense Microwave Generation,
R. C. Davidson, Y. Goren, and H. Uhm. 1975, 13p
Contracts N00014-75-C-0309, N00014-67-A-0239

Descriptors: Electric fields, *Microwaves, Sources, Waveguides, Stability, Nonlinear analysis.
Identifiers: *Negative mass instability.

The nonlinear development of of the negative-mass instability is investigated for a thin E-layer (Delta < < R sub 0) located inside a cylindrical waveguide. A quasilinear analysis shows that the instability saturates by the development of an energy spread and a corresponding increase in thickness Delta of the E-layer. The efficiency of microwave generation by this instability is also calculated. (Author)

AD-A070 827/1GA PC **A11**/MF **A01**
Illinois Univ at Urbana-Champaign Electromagnetics Lab
Source Radiation in the Presence of Convex Bodies.
Technical rept.,
Safieddin Safavi-Naini, and Raj Mittra. Jun 79, 228p Rept nos. UIEM-79-9, UILU-ENG-79-2552
Contract N00014-75-C-0293

Descriptors: *Electromagnetic scattering, *Diffraction, Cylindrical bodies, Asymptotic series, Comparison, Integration, Theory, Computer programs.
Identifiers: Geometrical theory of diffraction, Wiener-Hopf equations.

The first part of this work considers the problem of radiation from sources in the presence of smooth, convex, impenetrable objects and presents a brief survey of various high-frequency techniques. A generalization of the geometrical theory of diffraction and two new techniques -- based on the spectral domain approach and an asymptotic evaluation of the radiation integral for the surface current -- also are discussed. Some numerical results derived from the spectral domain formulas are presented, and a comparison with available theoretical and experimental data is included. The second part of this work describes a new technique for analyzing the radiation from a point electromagnetic source located on an infinitely conducting solid cylinder with a finite length. The method presented in this work is based upon a generalization of STD to the case of curved surfaces.

AD-A071 024/4GA PC **A03**/MF **A01**
Science Applications Inc La Jolla CA

Analytic Approaches to Unstable Resonators.
Final rept. 15 May 78-15 May 79,
J. Nagel, and D. Rogovin. 1979, 34p AFOSR-TR-79-0833
Contract F49620-78-C-0079

Descriptors: *Resonators, Diffraction, Waveguides, Nonlinear systems, Maxwells equations, Green's function, Eigenvalues, Approximation(Mathematics), Stability, Gain, Saturation.
Identifiers: Fresnel numbers, Unstable resonators, Eigenmodes, Geometrical optics, Asymptotes, Polarizable media, Integral equations.

A method for obtaining asymptotic solutions of the unstable resonator integral equation which is valid for all values of the magnification was developed. Approximations were made on the Greens functions rather than the eigenmodes, leading to results which are easily generalized to different mirror geometries. 'Diffraction dominated eigenmodes' for resonators where each ray escapes after a few transits were differentiated from 'waveguide dominated eigenmodes' which are obtained for cavities with a large number of transits per ray. The solutions obtained were seen to agree in the appropriate limits with other asymptotic solutions, numerical results, and geometric optics predictions. To include the effects of gain, the unstable resonator equation was derived from Maxwell's equations in a polarizable medium. The resulting equations have the same structure as the empty resonator equation, and similar approximations can be used. Some features of the effects of saturation on the eigenmodes of an unstable resonator were considered. (Author)

AD-A071 130/9GA PC **A10**/MF **A01**
Advisory Group for Aerospace Research and Development Neuilly-sur-Seine (France)
Aerospace Propagation Media Modelling and Prediction Schemes for Modern Communications, Navigation, and Surveillance Systems.
May 79, 208p Rept no. AGARD-LS-99
Presented at the Electromagnetic Wave Propagation Panel and the Consultant and Exchange Programme of AGARD presented on 4-5 June 1979 in London, United Kingdom, and in Boulder, USA 14-15 June 1979.

Descriptors: *Radio transmission, *Light transmission, *Atmospheric physics, Space communications, Radio navigation, Optical communications, visual surveillance, Ionospheric disturbances, Atmosphere models, Mathematical models, Mathematical prediction, Ray tracing, Sky waves, Frequency bands, Lectures.
Identifiers: *Foreign technology, NATO furnished, *Meetings,

The Lecture Series will review modelling and prediction topics which have been presented at a number of meetings of the AGARD Electromagnetic Wave Propagation Panel in the last few years. Modelling and Prediction Schemes of the aerospace radio and optical propagation environment based on media characterization have become essential to meet requirements of operational accuracies in communication, navigation, and surveillance in military and civilian systems. The lectures include the following topics: general modelling and prediction schemes; aerospace (atmosphere, ionosphere, and the space environment) media-characterization; short-and-long-term prediction techniques across the RF and optical spectrum and agreement with observational data; detection and communications through scattering channels; adaptability of prediction techniques to radio and optical communication, navigation and surveillance systems operating in the aerospace environment; and effects of geophysical disturbances on the state of the media andtheir predictability. The material in this publication was assembled in support of a Lecture Series under the sponsorship of the Electromagnetic Wave Propagation Panel and the Consultant and Exchange Programme of AGARD. (Author)

N79-28401/4GA PC **A03**/MF **A01**
Fondazione Ugo Bordoni, Rome (Italy).
Metodi di Analisi Per la Previsione Della Attenuazione Dovuta a Cammini Multipli (Analytical Method for the Prevision of Multipath Fading),
G. Marcheti. May 78, 49p FUB-22-1978
Language in Italian.

Descriptors: *Multipath transmission, *Signal fading, Telecommunication, Ultrahigh frequencies, Wave interaction, Atmospheric attenuation, Phase shift, Polarized electromagnetic radiation, Rayleigh distribution.
Identifiers: Mathematical models, *Fading.

For abstract, see STAR 1719

N79-28612/6GA PC **A06**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Aplicacao DA Teoria Uniforme de Kouyoumjian-Pathak No Estudo de Difracao de Blindagens Cilindricas (Applications of the Uniform Theory of Kouyoumjian-Pathak on the Study of Diffraction of Cylindrical Shields),
B. Dasilvamedeiroscorreiagalvao. Jan 79, 109p INPE-1416-TDL/001
In Portuguese; English Summary.

Descriptors: *Cylindrical bodies, *Diffraction patterns, *Electric dipoles, *Electromagnetic shielding, *Ultrahigh frequencies, Diffraction paths, Integral equations, Reflection, Shadows, Telecommunication.

For abstract, see STAR 1719

PB-298 648/7GA Not available NTIS
National Bureau of Standards, Washington, DC.
Laser-to-Microwave Frequency Division Using Synchrontron Radiation.
Final rept.,
D. J. Wineland. Apr 79, 5p
Pub. in Jnl. of Applied Physics 50, n4, p2528-2532, Apr 79.

Descriptors: *Frequency dividers, Microwave frequencies, Frequency synthesizers, Infrared lasers, Laser beams.
Identifiers: Reprints.

Calculations are made to demonstrate the feasibility of obtaining one-step frequency division from optical or infrared laser frequencies to a subharmonic in the microwave spectral region. The cyclotron orbit of a single relativistic electron in a Penning trap is driven with a Gaussian laser beam focused to a spot diameter approximately wavelength; the laser subharmonic frequency is measured from the electron synchrotron radiation. The uncertainty in orbit dimensions is limited to wavelength/2 by radiative cooling and the technique of motional sideband excitation.

PB-298 668/5GA PC **A07**/MF **A01**
National Telecommunications and Information Administration, Boulder, CO. Inst. for Telecommunication Sciences.
Ground Wave Propagation Over Irregular, Inhomogeneous Terrain: Comparisons of Calculations and Measurements,
R. H. Ott, L. E. Vogler, and G. A. Hufford. May 79, 140p NTIA/REPORT-79/20
Sponsored in part by Electromagnetic Compatibility Analysis Center, Annapolis, MD., and Space and Missile Systems Organization, Norton AFB, CA.

Descriptors: *Ground wave propagation, Computer programs, Measurement, Computation, Comparison, Terrain, Heterogenity.
Identifiers: WAGNER computer program, INTEQ computer program.

An algorithm (PROGRAM WAGNER) that evaluates HF ground-wave attenuation over irregular, inhomogeneous terrain is used to compare calculated field strengths with observed measurements for 9 actual paths and frequencies ranging from 120 kHz to 50 MHz. All comparisons show encouraging agreement between calculations and measurement. The 20 MHz comparisons over the Colorado Mountains provided a challenge for PROGRAM WAGNER.

PB-298 675/0GA PC **A04**/MF **A01**
National Engineering Lab. (NBS), Boulder, CO. Electromagnetic Fields Div.
Proceedings of the 1978 Electromagnetic Interference Workshop.
Special pub. (Final),
M. G. Arthur. Jul 79, 61p NBS-SP-551
Library of Congress catalog card no. 79-600091.
Proceedings of a Workshop held November 2-3, 1978 at the National Bureau of Standards, Gaithersburg, Maryland.

Descriptors: *Electromagnetic interference, *Meetings, Electromagnetic compatibility, Radiation effects, Standards, Radiation hazards, Frequency allocations.
Identifiers: Spectrum management.

This report is a summary of the overview talks and session discussions at the 1978 Electromagnetic Interference Workshop. These discussions addressed the following questions: What are the significant Electromagnetic Interference (EMI) problems. How serious are they. Which should be tackled first. What solutions are practical. Who is responsible for solutions. What new standards or changes in present voluntary standards are needed. What is needed for progress. Impacted areas featured at the workshop included communications, transportation, consumer products, industrial, and medical. Workshop speakers and attendees represented a broad segment of decision-makers in both industry and government.

UCRL-82323 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Natural Mode Methods in Frequency and Time Domain Analysis.
E. K. Miller. 30 May 79, 42p
Contract W-7405-ENG-48

Descriptors: *Electromagnetic radiation, Antennas, Electromagnetic fields, Numerical analysis, Radar, Scattering, Singularity, Spectra, Transients, Wires.
Identifiers: ERDA/657007.

For abstract, see ERA citation 04:044066.

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-A070 796/8GA PC **A03**/MF **A01**
Air Force Rocket Propulsion Lab Edwards AFB CA
X-Ray Spectroscopy as a Diagnostic Tool in Solid Propellant Combustion Flows.
Special technical rept. Feb 77-Feb 78,
W. K. McGregor. May 79, 49p Rept no. AFRPL-TR-78-61

Descriptors: *X ray spectroscopy, *Combustion, *Combustion products, *Solid rocket propellants, *Solid propellant rocket engines, Diagnosis(General), Particles, Density, Mass, Aluminum, Chlorine, Oxygen, Nitrogen, Carbon, Transmittance, Fluorescence.

X-ray spectroscopy offers a potential method for the measurement of composition, elemental density, and particle mass in the gas/particle flows of solid propellant rockets. A theoretical analysis was performed from which it was concluded that both transmittance and fluorescence measurements in the 1 to 10 keV photon energy range will yield elemental densities of Al and Cl and transmittance can possibly give O, N and C densities, although sensitivity for the latter three elements to transmittance is poor. The sensitivity of the K(alpha) fluorescence measurement to Al and Cl density changes is much greater than the sensitivity of transmittance measurements. However, the latter are required in order to determine densities directly from fluorescence rates. Hence, a combined transmittance and fluorescence measurement system is warranted. An investigation of commercially available hardware indicated that adequate detection systems exist, but insufficient data on photon flux rates from typical X-ray generating tubes was available to assess the adequacy of X-ray beam sources. Recommendations for proof-of-principle experiments are made, and a rocket test scenario is described for application to solution of the two-phase flow loss problem in solid propellant rockets. (Author)

AD-A071 121/8GA PC **A03**/MF **A01**
Aerospace Corp El Segundo CA Aerophysics Lab
Ignition of NF3 with Hydrocarbons and Fluorocarbons.
Interim rept.,
Peter Breisacher, and William A. Hicks. 7 Jun 79, 26p TR-0079(4725)-2, SAMSO-TR-79-45

Contract F04701-78-C-0079

Descriptors: Nitrogen compounds, Fluorides, *Ignition, *Spark ignition, Ignition lag, Chemical lasers, Combustion, Combustion products, Gas analysis, Hot wire, Fuels, Oxidizers, Ratios, Hydrocarbons, Fluorinated hydrocarbons.
Identifiers: *Nitrogen trifluoride, Nitrogen tetrafluoride, Feasibility, Chemical analysis.

The ignition characteristics of NF3 were studied with several hydrocarbons and fluorocarbons at various initial pressures and reactant concentrations. All tests were conducted statically in an instrumented high-pressure reaction vessel with the use of either spark or hot-wire ignition sources. Product gases were analyzed in order to determine combustion efficiency. Ignition delay, over-pressures, and temperature rise were determined for each test. The optimum oxidizer/fuel ratio for the most complete reaction of NF3 was determined for mixtures of NF3 and C2H4; NF3 and 1, 3 -C4H6; NF3 and C5H6; and NF3 and C2H2F2. The feasibility of using N2F4 as an injected additive for firing spontaneously spark-ignitable mixtures of NF3 and C2H4 at concentrations of up to 10% N2F4 in helium was investigated with negative results. (Author)

COO-2708T017-1 PC **A07**/MF **A01**
National Academy of Sciences, Washington, DC.
Department of Energy: Some Aspects of Basic Research in the Chemical Sciences.
1979, 144p
Contract EY-76-C-02-2708-017

Descriptors: *Chemical analysis, *Coal, *Combustion, *Radioactive waste disposal, *Reprocessing, Chemistry, Evaluated data, Information needs, Recommendations, Research programs.
Identifiers: ERDA/400800, ERDA/010000, ERDA/050800, ERDA/052002, ERDA/400100.

For abstract, see ERA citation 04:043580.

UCRL-82181 PC **A03**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Fundamental Flame-Speed Measurements in Combustion Gases Containing CF sub 3 Br. WSS Paper No. 79-16.
D. J. Parks, N. J. Alvares, and D. G. Beason. 23 Mar 79, 27p CONF-790434-2
Contract W-7405-ENG-48
Spring meeting on western states section, and the Combustion Institute, Provo, UT, USA, 23 Apr 1979.

Descriptors: Brominated aliphatic hydrocarbons, *Fire extinguishers, Fluorinated aliphatic hydrocarbons, *Propane, Additives, Air, Combustion, Flame propagation, Flames, Flammability, Mixtures.
Identifiers: ERDA/400800, ERDA/090110, *Methane/bromo-trifluoro.

For abstract, see ERA citation 04:039255.

21D. Fuels

AD-A070 519/4GA PC **A03**/MF **A01**
Army Armament Research and Development Command Dover NJ Large Caliber Weapon Systems Lab
Hazards Analysis of Energy Recovery from Army Ammunition Plant Solid Waste.
Final rept.,
Robert Scola. Apr 79, 35p ARLCD-TR-78080, AD-E400 308

Descriptors: *Solid wastes, *Waste recycling, Hazards, Fuels, Propellants, Explosives, Combustion, Pyrolysis, Ammunition, Grinding, Dust, Energy conversion, Contamination, Sensitivity, Explosions, *Munitions industry, Military facilities, Army, Safety.
Identifiers: Ammunition plants, Refuse derived fuels.

The generation of large quantities of solid waste at Army Ammunition Plants provides a potential fuel source to reduce dependence on costly fossil fuels. The current methods of disposing of this waste don't take advantage of the 15.7 MJ/kg heat content of the waste. The report discusses the potentially hazardous conditions of processing this waste for use as a fuel. (Author)

AD-A070 525/1GA MF **A01**
Air Force Aero Propulsion Lab Wright-Patterson AFB OH
Physical and Chemical Properties of JP-4 Fuel for 1978.
Final technical rept. Jan-Dec 78,
Blaine A. Heitkamp. Apr 79, 92p Rept no. AFAPL-TR-79-2040
Availability: Microfiche copies only.

Descriptors: *Jet engine fuels, Thermal stability, Chemical properties, Standards, Specifications, Military requirements, Sampling, Data acquisition, Test methods, Data reduction, Statistical analysis.
Identifiers: *JP-4 fuel.

Random samples of 651 fuel inspection reports on JP-4 fuel have been analyzed for the calendar year 1978. Determination of average properties and frequency distribution of these properties has been undertaken. Properties selected were twenty-three different parameters which coincide with JP-4 fuel specifications (MIL-T-5624K). Through comparison of previous reports, specifically 1975, it can be noted that no major fluctuations have occurred. In compiling the data, all reports were given equal weight regardless of what quantity of fuel was represented. Also, this year the only method used for testing fuel thermal stability was the JFTOT (ASTM Method D 3241) Fuel Coker. (Author)

AD-A070 739/8GA PC **A13**/MF **A01**
Monsanto Research Corp Dayton OH Dayton Lab
Analysis of Aircraft Fuels and Related Materials.
Final rept. 1 Feb 76-1 Jun 78,
F. N. Hodson, and J. D. Tobias . Mar 79, 287p MRC-DA-865, AFAPL-TR-79-2016
Contract F33615-76-C-2014

Descriptors: Aviation fuels, Jet engine fuels, *Chemical properties, *Physical properties, Heat of combustion, Vapors, Hydrocarbons, Density, Viscosity, Specific heat, Thermal conductivity, Gas chromatography.
Identifiers: *JP-9 fuel.

The physical properties of a series of JP-9 fuels, whose compositions covered the entire range allowed by the fuel specification, were determined. Included in the study are density, viscosity, surface tension, vapor pressure, specific heat, thermal conductivity, dielectric constant, air/nitrogen/water solubility, heat of combustion and freeze point. A proposed gas chromatographic method for the analysis of JP-9 fuel has been validated and results are reported. A survey of methods for hydrocarbon type analysis in fuels was conducted. Specific NMR approaches to this kind of analysis were applied to jet fuels and are presented. Analytical data are reported to determine the effect on combustion of modifying various fuels. A number of special studies which were conducted to aid in the solution of Air Force operational problems were conducted and are reported. (Author)

BMFT-FB-T-78-53 PC **A07**/MF **A01**
Technische Univ. Berlin (Germany, F.R.).
Physical and Chemical Investigations on Bituminous Coal Extracts and Their Fractionation.
A. Salinger. Dec 78, 129p
In German.
U.S. Sales Only.

Descriptors: *Coal, *Coal extracts, Bituminous coal, Coal rank, Experimental data, Fractionation, Molecular weight, Organic solvents, Organic sulfur compounds, *Solvent extraction, Tables, Yields.
Identifiers: ERDA/010407, West Germany.

For abstract, see ERA citation 04:042213.

BNL-26130 PC **A02**/MF **A01**
Brookhaven National Lab., Upton, NY.
Advanced Synfuel Production with Fusion.
J. R. Powell, and J. Fillo. 1979, 8p CONF-790803-26
Contract EY-76-C-02-0016
14. intersociety energy conversion conference, Boston, MA, USA, 5 Aug 1979.

Descriptors: *Hydrogen production, *Thermonuclear reactors, Economics, Electrolysis, Production, Synthetic fuels, Water.
Identifiers: ERDA/060300, ERDA/080100.

For abstract, see ERA citation 04:042480.

COO-0063-10 PC **A02**/MF **A01**
Duquesne Univ. of the Holy Ghost, Pittsburgh, PA. Dept. of Chemistry.
Hydrogen Bonding in Asphaltenes and Coal. Quarterly Report, July 1--September 30, 1978.
N. C. Li, and K. C. Tewari. 29 Sep 78, 23p
Contract EY-76-S-02-0063

Descriptors: *Asphaltenes, *Coal liquids, *Chemical bonds, Fractionation, Nuclear magnetic resonance, Viscosity.
Identifiers: ERDA/010600, ERDA/010405.

For abstract, see ERA citation 04:042214.

COO-4298-1 PC **A03**/MF **A01**
Purdue Univ., Lafayette, IN. School of Chemical Engineering.
Conversion of Biomass from Agriculture into Useful Products. Final Report.
G. T. Tsao. 31 Jul 78, 37p
Contract EG-77-S-02-4298

Descriptors: Butanediol, *Aeromonas, *Cellulose, *Ethanol, *Hexoses, *Klebsiella, *Pentoses, *Uronic acids, *Agricultural wastes, Biosynthesis, Dissolution, Enzymatic hydrolysis, Fermentation, Hemicellulose, Metabolism, Research programs, Solvents, Sulfuric acid.
Identifiers: ERDA/090222, ERDA/140504, Solid wastes, Synthetic fuels, Manufactured gas.

For abstract, see ERA citation 04:044467.

COO-4740-3 PC **A02**/MF **A01**
Management and Technical Services Co., Clairton, PA.
Operation, Modification, and Maintenance of DOE/PETC 700 H.P. Combustion Test Facility. Quarterly Activity Report, October 2--December 31, 1978.
1979, 7p
Contract EW-78-C-02-4740

Descriptors: Coal, *Fuel oils, *Fuel slurries, Combustion, Mixtures, Pilot plants, Test facilities.
Identifiers: ERDA/014000, ERDA/025000, Boilers.

For abstract, see ERA citation 04:042265.

DFVLR-FB-78-17 PC **A03**/MF **A01**
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt e.V., Hardthausen (Germany, F.R.). Inst. fuer Chemische Antriebe und Verfahrenstechnik.
Photolytic Decomposition of Water into Oxygen and Hydrogen as an Alternative Energy Utilization of Households and Small Consumers.
W. U. Wendekamm. 1978, 47p
In German.
U.S. Sales Only.

Descriptors: *Hydrogen production, *Solar energy conversion, Oxygen, Photolysis, Production, Water.
Identifiers: ERDA/080106, ERDA/140505, West Germany.

For abstract, see ERA citation 04:042493.

DOE/EIA-0102/39 PC **A03**/MF **A01**
Department of Energy, Washington, DC.
Motor Gasoline Prices Through 1980 under Continued DOE Price Controls.
R. Farmer. 10 Jan 79, 38p

Descriptors: *Gasoline, Charges, Control, Economic growth, Economic policy, Inflation, OPEC, Petroleum refineries, Refining, US DOE.
Identifiers: ERDA/293000, ERDA/020700, ERDA/020500, ERDA/294002, ERDA/290200, Prices.

For abstract, see ERA citation 04:038916.

DOE-tr-184 PC **A07**/MF **A01**
Serious Management of Biogas.
Mar 79, 136p
C Earnest effective management of marsh gas; Agricultural Press Publishing House, New China Bookstore, BeiJing Branch, Nov 1, 1975.

Descriptors: *Methane, *Organic wastes, Anaerobic digestion, Biosynthesis, Energy policy, Energy sources.

Identifiers: ERDA/090122, Translations, China, Agricultural wastes, Solid wastes, Manufactured gas, Synthetic fuels.

For abstract, see ERA citation 04:042515.

EPRI-AF-1036-SY PC **A03**/MF **A01**
Science Applications, Inc., Bellevue, WA.
Executive Summary: Workshop on Biomass Energy and Technology. Final Report.
G. R. Stegen. Mar 79, 31p

Descriptors: *Biomass, Availability, Bioconversion, Biomass plantations, Combustion, Energy conversion, Information needs, Meetings, Recommendations, Research programs, Thermochemical processes.
Identifiers: ERDA/090000, ERDA/140504.

For abstract, see ERA citation 04:042506.

FE/EES-79/3 PC **A02**/MF **A01**
Department of Energy, Morgantown, WV. Process Evaluation Office.
Coal-Oil Mixture: Transportation Factors.
T. C. Campbell. Jan 79, 14p

Descriptors: *Coal, *Fuel oils, *Fuel slurries, Mixtures, Site selection, Transport.
Identifiers: ERDA/013000, ERDA/022000, *Energy transport, Transportation.

For abstract, see ERA citation 04:044266.

FE-2537-8 PC **A02**/MF **A01**
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
Characterization of Coal-Derived Liquids and Other Fossil Fuel Related Materials Employing Mass Spectrometry. Quarterly Report, June 30--September 29, 1978.
S. E. Scheppele. 1 Dec 78, 24p
Contract EX-76-S-01-2537

Descriptors: *Coal liquids, *Mass spectroscopy, Accuracy, Data acquisition systems, Distillation, Mass spectrometers, Performance.
Identifiers: ERDA/010600, ERDA/010405, ERDA/400105, Samples.

For abstract, see ERA citation 04:042218.

FE-2550-6 PC **A03**/MF **A01**
Michigan Univ., Ann Arbor.
Physical and Chemical Behavior of Liquefied Coal in Solids Separation. Quarterly Report, January--March 1978.
D. E. Briggs, D. V. Addington, J. R. Cameron, J. A. McKeen, and P. A. S. Smith. Apr 78, 47p
Contract EX-76-S-01-2550

Descriptors: *Asphaltenes, *Coal liquids, Coal liquefaction, Distillation, Electrophoresis, Filtration, Fractionation, Rheology, Solubility, Structural models, Temperature dependence, Viscosity.
Identifiers: ERDA/010405, ERDA/010402, ERDA/010600, Separation, *Acidity, *Alkalinity.

For abstract, see ERA citation 04:044229.

FE-2550-7 PC **A04**/MF **A01**
Michigan Univ., Ann Arbor.
Physical and Chemical Behavior of Liquefied Coal in Solids Separation. Quarterly Report for Period Ending June 30, 1978.
D. E. Briggs, R. Brack, and B. Ho. Jul 78, 62p
Contract EX-76-S-01-2550

Descriptors: *Asphaltenes, *Coal liquids, Coal liquefaction, *Dielectric properties, Electric conductivity, Electrodeposition, Filtration, Organic solvents, Rheology, Viscosity.
Identifiers: ERDA/010405, ERDA/010402, Molecular weights.

For abstract, see ERA citation 04:044230.

FE-2727-4 PC **A03**/MF **A01**
Mississippi Univ., University. Dept. of Chemical Engineering.
Mass Transport Characteristics of Zeolite Cracking Catalysts. Quarterly Report, July 1--September 30, 1978.
H. W. Haynes, Jr. 13 Oct 78, 30p
Contract EF-77-S-01-2727

Descriptors: *Coal liquids, *Tetralin, *Zeolites, *Catalytic cracking, Catalytic effects, Diffusion, Gas chromatography, *Mass transfer, Microstructure, Porosimeters, Porosity.
Identifiers: ERDA/010405, Ion exchange resins.

For abstract, see ERA citation 04:042199.

FE-2729-4 PC **A04**/MF **A01**
Brigham Young Univ., Provo, UT.
Alloy Catalysts with Monolith Supports for Methanation of Coal-Derived Gases. Annual Technical Progress Repot, September 20, 1977--September 20, 1978.
C. H. Bartholomew. Oct 78, 67p
Contract EF-77-S-01-2729

Descriptors: Carbon, *Catalysts, Cobalt, Hydrogen, Methanation, Nickel, Platinum, Carbonyls, Catalytic effects, Chemical preparation, Chemisorption, Coal gasification, Deactivation, Deposition, Experimental data, Graphs, Hydrogen sulfides, Nickel compounds, Specificity, Tables.
Identifiers: ERDA/010404.

For abstract, see ERA citation 04:044214.

LA-7776-PR PC **A02**/MF **A01**
Los Alamos Scientific Lab., NM.
Combined CO sub 2 --O Sub 2 Underground Pyrolysis-Gasification of Southwestern Coals. Progress Report, January--March 1978.
N. E. Vanderborgh, and G. R. B. Elliott. Apr 79, 11p
Contract W-7405-ENG-36

Descriptors: *In-situ gasification, *Subbituminous coal, Carbon dioxide, Coal, *Coal gasification, Drying, Feasibility studies, Heat transfer, *Mass transfer, Oxygen, Permeability, Porosity, Pyrolysis, Shrinkage.
Identifiers: ERDA/010404, ERDA/010600, Revisions.

For abstract, see ERA citation 04:042170.

LA-7820-PR PC **A11**/MF **A01**
Los Alamos Scientific Lab., NM.
Critical Review and Assessment of Environmental and Safety Problems in Hydrogen Energy Systems. Progress Report, October 1, 1977--September 30, 1978.
F. J. Edeskuty, and N. N. Sheheen. May 79, 249p
Contract W-7405-ENG-36

Descriptors: *Hydrogen, Alloys, Embrittlement, Environmental impacts, Hydrogen production, Metallurgical effects, Metals, Pipelines, Regulations, Safety, Transport.
Identifiers: ERDA/080500, ERDA/080900.

For abstract, see ERA citation 04:044454.

NP-23604(V.C) PC **A18**/MF **A01**
InterGroup Consulting Economists Ltd., Winnipeg (Manitoba).
Liquid Fuels from Renewable Resources: Feasibility Study. Volume C. Forest Studies.
Mar 78, 403p
U.S. Sales Only.

Descriptors: *Liquid fuels, *Wood, Allocations, Biomass, Conversion, Data analysis, Economics, Energy source development, Environmental effects, Evaluated data, Feasibility studies, Forecasting, Forests, Inventories, Land use, Liquefaction, Maps, Production, Renewable energy sources, Resource potential, Tables, Trees, Wood products industry.
Identifiers: ERDA/299003, ERDA/553000, ERDA/140504, Canada, Synthetic fuels, Manufactured gas, Solid wastes.

For abstract, see ERA citation 04:030546.

NP-23604(V.D-E) PC **A09**/MF **A01**
InterGroup Consulting Economists Ltd., Winnipeg, (Manitoba).
Liquid Fuels from Renewable Resources: Feasibility Study. Volume D. Agricultural Studies. Volume E. Municipal Waste Studies.
Mar 78, 183p
U.S. Sales Only.

Descriptors: *Biomass, *Liquid fuels, *Municipal wastes, *Renewable resources, Cost, Data compilation, Domestic animals, Economic analysis, Feasibility studies, Sewage sludge, Solid wastes, Tables.
Identifiers: ERDA/299003, ERDA/140504, ERDA/553000, ERDA/090222, Canada, Synthetic fuels, Manufactured gas.

For abstract, see ERA citation 04:030547.

NP-23689 PC **A06**/MF **A01**
Institute for Industrial Research and Standards, Dublin (Ireland). Technical Information Div.
Current Awareness Bulletin, July--August 1978.
Nov 78, 118p
U.S. Sales Only.

Descriptors: *Agricultural wastes, *Biomass, *Municipal wastes, *Wood wastes, Alcohols, Ammonia, Bibliographies, Cellulose, Combustion, Forestry, Manures, Methane, Sewage, Synthetic fuels.
Identifiers: ERDA/140504, ERDA/090122, ERDA/090222, ERDA/090320, ERDA/090400, Ireland, *Synthetic fuels, Manufactured gas, *Solid wastes.

For abstract, see ERA citation 04:042631.

NP-23693 PC **A03**/MF **A01**
Institute for Industrial Research and Standards, Dublin (Ireland). Technical Information Div.
Retrospective Search on Short Rotation Forestry Update: March 1977--February 1978.
Feb 78, 37p
U.S. Sales Only.

Descriptors: *Forestry, *Wood, *Wood wastes, *Bibliographies, Boilers, Combustion.
Identifiers: ERDA/140504, ERDA/090400, Ireland, *Solid waste disposal.

For abstract, see ERA citation 04:040541.

NP-23701 PC **A03**/MF **A01**
Institute for Industrial Research and Standards, Dublin (Ireland). Technical Information Div.
National Inventory of Biomass Resources: Ireland.
Mar 77, 39p
U.S. Sales Only.

Descriptors: *Agricultural wastes, *Biomass, Ireland, *Manures, *Wood wastes, Inventories.
Identifiers: ERDA/140504.

For abstract, see ERA citation 04:040542.

N79-28349/5GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Use of Refinery Computer Model to Predict Fuel Production.
F. J. Flores. Jun 79, 25p NASA-TM-79203, E-088

Descriptors: *Crude oil, *Jet engine fuels, *Prediction analysis techniques, *Productivity, *Refining, *Yield, Boiling, Energy consumption, Freezing, Hydrogen, Industrial plants, Petroleum products.
Identifiers: Computerized simulation, *Petroleum refining, Energy models.

For abstract, see STAR 1719

PATENT-4 128 473
Not available NTIS
Department of Energy, Washington, DC.
Catalytic Hydrotreating Process.
Patent,
C. Karr, Jr., and K. B. McCaskill. Filed 5 Dec 77, patented 5 Dec 78, 16p PAT-APPL-857 718
Supersedes PAT-APPL-857 718-77.
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC 20231 $0.50.

Descriptors: *Coal liquids, *Coal tar, *Residual fuels, *Shale oil, *Sulfides, Catalysts, Catalytic effects, Hydrogenation.
Identifiers: ERDA/010405, ERDA/020400, ERDA/040403, *Patents.

For abstract, see ERA citation 04:042207.

TID-28915 PC **A16**/MF **A01**
TERA, Inc., Arlington, VA.

Capital Requirements for the Transportation of Energy Materials Based on PIES Scenario Estimates.
A. Gezen, M. J. Kendrick, S. S. Khan, and N. F. Mellen. 15 Aug 78, 364p
Contract EC-77-C-01-8596

Descriptors: *Coal, *Natural gas, *Petroleum, *Petroleum products, *Transportation systems, Barges, Capital, Demand factors, Evaluation, Forecasting, Government policies, Investment, Pipelines, Project independence, Railways, Ships, Surface waters, Transport.
Identifiers: ERDA/290700, ERDA/290200, ERDA/013000, ERDA/022000, ERDA/032000, *Energy transport.

For abstract, see ERA citation 04:030407.

UCRL-81614 PC **A02**/MF **A01**
California Univ., Livermore. Lawrence Livermore Lab.
Reaction Kinetics Between Steam and Oil Shale Char.
A. K. Burnham. Oct 78, 7p CONF-790415-8
Contract W-7405-ENG-48
177. ACS national meeting, Honolulu, HI, USA, 1 Apr 1979.

Descriptors: *Chars, *Oil shales, *Steam, *Chemical reaction kinetics, Chromatography, Rock-fluid interactions.
Identifiers: ERDA/040402.

For abstract, see ERA citation 04:032441.

21E. Jet and Gas Turbine Engines

AD-A070 623/4GA PC **A17**/MF **A01**
Indianapolis Center for Advanced Research IN Fluid Dynamics Labs
Compressor Research Facility Aerodynamics Analysis.
Final technical rept. Oct 74-Jul 78,
G. David Huffman. Apr 79, 379p FDL-78-005, AFAPL-TR-79-2021
Contract F33615-75-C-2008

Descriptors: *Axial flow compressors, *Turbojet engines, Test facilities, Flow fields, Flight simulation, Aerodynamic characteristics, Altitude chambers, Flow rate, Mass flow, Measurement, Scale models, Instrumentation, Venturi tubes.
Identifiers: J-85 engines.

This report documents a series of aerodynamic studies carried out jointly by AFAPL and ICFAR personnel in support of the design and development of the AF Aero Propulsion Laboratory Compressor Research Facility (CRF). The CRF is a non-return compressor test facility with air extracted from the atmosphere, compressed and then discharged to the atmosphere. In order to reduce compressor power requirements and simulate flight conditions at elevated altitudes, the compressor is mounted in a large tank or text chamber. The tank pressure is regulated with control valves with the compressor itself supplying the exhauster capability. The mass flow rate is measured downstream of the compressor using a series of venturis. The CRF utilizes automated data handling procedures and is capable of simulating some compressor transients. A pilot program utilizing an existing J-85 engine test facility at AFAPL was initiated to explore and develop the measurement technology required in transient compressor testing.

AD-A070 701/8GA PC **A11**/MF **A01**
Air Force Inst of Tech Wright-Patterson AFB OH School of Engineering
An Investigation of Flame Stability in a Coaxial Combustor.
Doctoral thesis,
Edward T. Curran. Jan 79, 243p Rept no. AFIT/AE/DS79-1

Descriptors: *Combustors, *Flames, *Combustion stability, *Ramjet engines, *Integral rocket ramjets, Coaxial configurations, Correlation techniques, Oscillation, Ignition, Combustion.
Identifiers: Dump combustion, Sudden expansion combustors.

An investigation of the flame stability of a coaxial dump combustor was made. A 6.0 inch diameter combustor was studied, and the inlet diameter was varied from 2.5 inch to 5.0 inch. Tests were carried out using pre-mixed ethylene/air and JP-4/air. The inlet temperature levels were generally in the range 1000-1250 R; the corresponding pressure was varied between approximately 10 and 40 psia. Inlet Mach numbers were typically in the range 0.2 to 0.9. The flame stability data were not collapsed by a conventional correlation. A new correlation parameter was derived by modelling the annular recirculation zone as an adiabatic stirred reactor using a one-step chemical reaction: this parameter gave successful correlations. The dominant variable in flame stability was the inlet temperature. The effect of velocity on the lean limit was small. Some tests were performed with addtional fuel injection directly into the recirculation zone, which yielded an estimate of the air mass flow fraction entrained into the recirculation zone. Finally, tests were performed using a transparent combustor; it was observed that the combustion process was an oscillatory phenomenon. A review of the literature concerning the flame stability and aerodynamics of coaxial combustors is presented(Author)

AD-A070 754/7GA PC **A06**/MF **A01**
Biphase Energy Systems Santa Monica CA
Analysis of Two-Phase Flow in Nozzles and Turbine Buckets.
Final rept. 1 Jul 78-30 Apr 79,
Emil Ritzi. 1 Jun 79, 104p Rept no. 108-F
Contract N00014-78-C-0649

Descriptors: *Convergent divergent nozzles, *Two phase flow, Mathematical models, Drops, Sizes(Dimensions), Velocity, Trajectories, Nozzle throats, Turbines, Computer programs.
Identifiers: *Droplets, *Slip ratio, Turbine buckets.

A one-dimensional analytical study was made of the two-phase flow of wet steam in a convergent-divergent nozzle with negligible wall friction. The liquid phase is assumed to consist of a cloud of spherical droplets, whose size is either controlled by a critical Weber number or predetermined. Nozzle geometry, phase velocities, mass flux density and local efficiencies are determined by numerical integration from the basic differential equation. The two-dimensional two-phase flow in impulse turbine buckets was also investigated. The parameters that control the deviation angle of the droplets from the gas path are identified. (Author)

AD-A070 935/2GA PC **A06**/MF **A01**
Pratt and Whitney Aircraft Group West Palm Beach FL Government Products Div
Structural Life Prediction and Analysis Technology.
Final rept. Oct 75-Nov 78,
T. A. Cruse, and T. G. Meyer. Dec 78, 123p
PWA-FR-10896, AFAPL-TR-78-106
Contract F33615-75-C-2063

Descriptors: *Fatigue tests(Mechanics), *Fatigue life, Gas turbines, Disks, Engine components, Life tests, Stress strain relations, Strain hardening, Creep, Correlation techniques, Notch toughness, Residual stress, Stress relaxation.
Identifiers: *Gas turbine rotors.

An improved low cycle fatigue (LCF) life exhaustion method has been developed for gas turbine engine disks subjected to complex mission history loading. The method has been incorporated into a computer program for LCF life exhaustion prediction as a function of component, material, mission history, and mission ordering. Principal advances in LCF life modeling include a simple strain range-mean stress correlation model, a predictive model for the effects of strain hardened surface layers due to machining and the effects of dwell (creep) due to elevated temperature exposure time, a fracture mechanics-based nonlinear, cumulative damage model, a statistical basis for minimum part life prediction, and full-scale component verification. Simplified procedures for nonlinear stress (strain) analysis of notches were developed and calibrated with finite element results. Recommendations for further research emphasize the need for improved constitutive models of cyclic creep/plasticity, a better definition of the effects of various machining operations on material work hardening, as well as residual stresses. Calibrated models for small flaw fracture mechanics would benefit the definition of the cumulative damage algorithm. Finally, the need to control process variability in order to improve part life is emphasized. (Author)

AD-A070 950/1GA PC **A21**/MF **A01**
Advisory Group for Aerospace Research and Development Neuilly-sur-Seine (France)
Stresses, Vibrations, Structural Integration and Engine Integrity (Including Aeroelasticity and Flutter).
Conference proceedings.
Apr 79, 498p Rept no. AGARD-CP-248
Presented at the Propulsion and Energetics Panel Meeting (52nd) Held in Cleveland, Oh, 23-28 Oct 78.

Descriptors: *Aircraft engines, *Jet engines, *Stress analysis, Life expectancy, Dynamics, Structural analysis, Vibration, Flutter, Aeroelasticity, Wing body configurations, Impellers, Compressor blades, Rotor blades(Turbomachinery), Symposia.
Identifiers: NATO furnished, *Meetings.

These Conference Proceedings contain 33 papers presented at the 52nd Symposium of the AGARD Propulsion and Energetics Panel, held at Cleveland, Ohio, USA, on 23-28 October 1978. the papers were grouped into eight sessions covering the following topics: Experimental Stress Analysis; Stress Analysis Techniques, Life Prediction; Engine Structural Integrity, Vibration and Containment; Engine-Airframe Integration/Compatibility; Aeroelasticity and Flutter. The discussions after each presentation are included in the Conference Proceedings. The meeting covered engine development, engine-aircraft integration and engine operation. It led into the over-riding concern of the current aircraft engine systems: the durability and life management of aircraft gas turbine engines. The papers of this Symposium are all connected with this, most of them address real engines, but only few actually show failed engine parts. Some correlations between analysis and test or field experience are included. (Author)

AD-A071 020/2GA PC **A02**/MF **A01**
Calspan Advanced Technology Center Buffalo NY
Theoretical Studies of Three Dimensional Transonic Flow through a Compressor Blade Row.
Annual technical rept. 1 Apr 78-31 Mar 79,
William J. Rae. 31 Mar 79, 12p CALSPAN-6275-A-1, AFOSR-TR-79-0805
Contract F49620-78-C-0057

Descriptors: *Compressor blades, *Transonic flow, Three dimensional flow, Flow fields, Axial flow compressors, Dynamic loads, Numerical methods and procedures, Inviscid flow, Potential theory.

Three-dimensional flow effects play an important role in the performance of axial-flow fans and compressors that operate at transonic speeds. The coupling between transonic and three-dimensional effects limits the applicability of the two-dimensional analysis methods that have been in use for some years. The present research program was undertaken with the aim of extending these numerical techniques, so as to handle more fully the nonlinearity of the problem. Thus, heavily loaded blades with large turning angles are to be considered, and the simplifications of small-disturbance theory (such as satisfaction of boundary conditions on mean-chord surfaces, neglect of trailing vortex-sheet deformation) will not be used.

AD-A071 028/5GA PC **A04**/MF **A01**
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Aerospace and Ocean Engineering
Liquid Fuel Jet Injection into a Simulated Subsonic 'Dump' Combustor.
Interim rept.,
John C. Ogg, and Joseph A. Schetz. May 79, 60p VPI-AERO-093, AFOSR-TR-79-0769
Grant AFOSR-78-3485

Descriptors: *Fuel injection, *Liquid jets, *Combustors, Flow fields, Two dimensional, Subsonic flow, Simulation, Water injection, Integral rocket ramjets.
Identifiers: *Dump combustors.

Basic experimental studies of the injection of liquid fuel into a two dimensional flowfield designed to represent a sudden-expansion 'dump' combustor

were performed under cold-flow conditions. Test conditions were as follows: 0.6 entrance Mach number, 25 PSIA total pressure, and nominally 75 F stagnation temperature. Two step heights were investigated, 1.0 in. in 0.5 in., corresponding to area ratios of 1.33 and 1.17. The investigation included Pitot and static pressure distributions, spark and streak shadowgraphs, surface flow visualization, direct photographs and videotape recordings.

AD-A071 049/1GA PC **A03**/MF **A01**
DCW Industries Inc Studio City CA
Development of a Viscous Theory of Three-Dimensional Flow in Highly-Loaded Axial Turbomachines.
Interim scientific rept. 31 Mar 78-31 Mar 79,
David C. Wilcox. Jun 79, 31p DCW-R-21-01, AFOSR-TR-79-0804
Contract F49620-78-C-0024

Descriptors: *Viscous flow, Axial flow, Three dimensional flow, Theory, Turbomachinery, *Axial flow turbines, Rotation, Air flow, Computer programs, Inviscid flow, Finite difference theory.

A computer program is being developed which will be suitable for numerically simulating three-dimensional viscous flow in rotating turbomachines. This report summarizes progress to date and gives projections of work to be accomplished during the next year. (Author)

AD-A071 051/7GA PC **A07**/MF **A01**
General Electric Co Lynn MA Aircraft Engine Group
Cast Titanium Compressor Casing.
Final rept. Jul 76-Dec 78,
W. H. Ficht. May 79, 137p USARTL-TR-79-8
Contract DAAJ02-76-C-0057

Descriptors: *Titanium alloys, *Casting, *Centrifugal casting, *Turboshaft engines, *Compressors, Casting alloys, Precision, Shape, Mechanical properties, Ballistics.
Identifiers: *Titanium alloy 6Al 4V, T-700 Turboshaft engines.

The development of a process for centrifugally casting the Ti 6Al-4V compressor casing for the T700 turboshaft engine is described. The cast casing results in a 35-pound saving of material input and a 30-hour saving of shop labor (at the 250th unit) compared to the forging which it replaces, due to the cast net shape outer contour which includes features formerly welded to the forged casing. Conventional expendable wax patterns and ceramic shell molds were chosen over a permanent metallic mold system. Preheated molds were mounted vertically on a centrifuge and rotated at from 350 to 500 rpm during casting. Mechanical properties were well within design requirements although generally lower than forged properties. Ballistic testing showed the containment capability of the cast and forged material to be equal. Two cast casings were run in test engines and were judged to be equal in performance to forgings. There was no weight penalty associated with the use of a cast casing. (Author)

AD-A071 055/8GA PC **A06**/MF **A01**
Pratt and Whitney Aircraft Group West Palm Beach FL Government Products Div
Marine Gas Turbine Hot Corrosion Dependence on Ingested Salt Levels.
Final technical rept. 29 Jul 77-31 Oct 78,
R. H. Barkalow, and F. S. Pettit. 16 Apr 79, 110p
Rept no. PWA-FR-11544
Contract N00173-77-C-0206

Descriptors: *Gas turbines, *Marine engines, *Ingestion(Engines), *Salts, *Corrosion, *Nickel alloys, *Cobalt alloys, Sulfur oxides, Sodium chloride, Refractory coatings, Microstructure.
Identifiers: Nickel alloy IN-792, Cobalt alloy mar-M-509.

Turbine section hardware in marine engines is susceptible to hot corrosion attack induced by salt deposition. In attempting to control this type of materials degradation, it is necessary to examine the dependence of hot corrosion on ingested salt level and to determine the deposition rate below which hot corrosion attack will be negligible. Test specimens (uncoated and aluminized Mar-M509 and IN792, CoCrAlY-coated IN 792) were exposed at 700 and 900 C in laboratory tube furnaces to conditions which induce hot corrosion attack. The microstructures developed in these tests were compared with those observed in service hardware. A test at 700 C with a salt deposit of sodium sulfate, either pure or mixed with metallic sulfates, and a gaseous environment of oxygen with approximately .0001 atm SO3 was found to most closely duplicate the degradation microstructure most common in hardware from marine service. Results support the hypothesis that any condensed salt deposit is likely to produce unacceptable hot corrosion and hence the only safe ingestion level is that which produces no salt deposition on turbine hardware.

AD-A071 107/7GA PC **A09**/MF **A01**
Pennsylvania State Univ University Park Applied Research Lab
The Design and Analysis of Turbomachinery in an Incompressible, Steady Flow Using the Streamline Curvature Method.
Technical memo.,
Mark W. McBride. 13 Feb 79, 181p Rept no. ARL/PSU/TM-79-33
Contract N00024-79-C-6043

Descriptors: *Turbomachinery, *Incompressible flow, Computer aided design, Fluid flow, Hydrodynamics, Mathematical models, Turbine parts, Ducts, Turbine blades, Cascade structures, Flow fields, Equations of motion, Viscous flow, Turbulent flow, Boundary layer, Spatial distribution, Load distribution, Hydraulic pressure pumps, Airfoils, Mean, Mathematical prediction, Digital simulation, Numerical methods and procedures.
Identifiers: Streamline curvature method, Through-flow, Design.

The design of new and more efficient turbomachinery requires an improved understanding of the fluid flow phenomena associated with the duct and blading required for the operation of such devices. In recent years, the digital computer has made possible the solution of equations of motion pertinent to this field. This study deals with the design and analysis of turbomachinery in an incompressible, steady flow, such as hydraulic pumps and turbines. The basic numerical approach used in the analysis of these devices is the Streamline Curvature Method. Development of a turbomachine design method requires an accurate model of the through-flow describing the spatial variation of the velocity and pressure in the fluid. Equations of motion are developed in a way that allows modeling of the blade row spanwise and chordwise loading distributions on a blade row and determination of their effect on the through-flow. The equations are solved using the Streamline Curvature Method with effects of viscosity and turbulene included in an empirical fashion due to the complexity of the governing equations. Experimental investigations were performed to validate each of the analysis and design methods described. In general, performance of the various test articles was in agreement with predictions. It is apparent, however, that phenomena associated with turbulent and viscous flows require more sophisticated modeling than those used in this study.

AD-A071 169/7GA PC **A02**/MF **A01**
General Electric Co Cincinnati OH Aircraft Engine Group
Foreign Object Impact Design Criteria.
Interim technical rept. 19 Sep-31 Dec 77,
Albert F. Storace. Oct 78, 19p R78AEG180, AFAPL-TR-78-81
Contract F33615-77-C-5221

Descriptors: *Compressor blades, *Fan blades, *Impact, Structural response, Transients, Bird strikes, Ice, Loads(Forces), Failure(Mechanics), Impact strength, Leading edges, Turbine blades, Damage assessment, Mathematical models, Impact tests.
Identifiers: Design, Impact loads, *Jet aircraft, *Turbojet engines.

The program objective is to develop and validate structural design criteria that account for the transient overloads by bird and ice impacts on turbine engine first-stage fan/compressor blades. a design system structure was completed. Work was started on development of transient response models and impact loading models. Tests and analyses to be used to generate local leading edge damage design data were defined. Planning was initiated for gross structural damage investigations and structural element tests. Formulations of a matrix for parametric analysis was started. Three first stage blades were selected for modeling and testing. (Author)

DOE/NASA/0008-78/4 PC **A03**/MF **A01**
Ford Motor Co., Dearborn, MI.
Evaluation of Advanced Regenerator Systems.
J. A. Cook, C. A. Fucinari, J. N. Lingscheit, and C. J. Rahnke. Aug 78, 35p NASA-CR-159422
Contract EY-76-C-02-2630

Descriptors: *Automobiles, *Gas turbines, *Regenerators, Aluminium silicates, Ceramics, Cost, Experimental data, Fabrication, Graphs, Heat exchangers, Magnesium compounds, Performance testing, Thermodynamic properties.
Identifiers: ERDA/330103.

For abstract, see ERA citation 04:030746.

N79-28176/2GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
A Throat-Bypass Stability-Bleed System Using Relief Valves to Increase the Transient Stability of a Mixed-Compression Inlet.
G. H. Neiner, M. O. Dustin, and G. L. Cole. Jul 79, 47p NASA-TP-1083, E-8950

Descriptors: *Air intakes, *Bypasses, *Flow stability, *Supersonic inlets, Wind tunnel tests, *Yf-12 aircraft, Angle of attack, Fluid mechanics, Supersonic wind tunnels, Throats.

For abstract, see STAR 1719

N79-28177/0GA PC **A04**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Effect of Rotor Meridional Velocity Ratio on Response to Inlet Radial and Circumferential Distortion.
N. L. Sanger. Jul 79, 73p NASA-TP-1278, E-8987

Descriptors: *Compressor rotors, *Flow distortion, Inlet flow, Meridional flow, *Rotor aerodynamics, Velocity distribution, Blade tips, Radial flow, Rotor speed, Stator blades.

For abstract, see STAR 1719

N79-28456/8GA PC **A03**/MF **A01**
Detroit Diesel Allison, Indianapolis, IN.
Laser Anemometer Measurements at the Exit of a T63-C20 Combustor.
Final Report, Sep. 1978 - Apr. 1979.
D. B. Zimmerman. Apr 79, 44p NASA-CR-159623, DDA-RN-79-4
Contract NAS3-21267
Subm-Sponsored in Part by Army Research and Develop. Command, Cleveland.

Descriptors: *Combustion, *Combustion chambers, *Gas turbine engines, Laser doppler velocimeters, *Turbulent flow, Annuli, Flight simulation, Particle size distribution, Phenols, Signal reception.

For abstract, see STAR 1719

N79-28555/7GA PC **A15**/MF **A01**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Off-Design Performance of Gas Turbines, Volume 1.
1978, 349p VKI-LEC-SER-1978-2-V-1
Seri-2. Conf-Lectures Held at Rhode-Saint-Genese, Belgium, 30 Jan. - 3 Feb. 1978.

Descriptors: *Conferences, *Design analysis, *Engine design, *Gas turbines, *Performance prediction, Aerodynamic stalling, Axial flow turbines, Computerized design, Numerical analysis, Turbine blades.
Identifiers: *Meetings.

For abstract, see STAR 1719

N79-28562/3GA PC **A10**/MF **A01E**
Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
Off-Design Performance of Gas Turbines, Volume 2.
1978, 225p VKI-LEC-SER-1978-2-V-2

Seri-2. Conf-Lecture Held at Rhode-Saint-Genese, Belgium, 30 Jan. - 3 Feb. 1978.

Descriptors: *Conferences, *Design analysis, *Gas turbines, *Performance prediction, Computerized design, Dynamic characteristics, Engine design, Numerical analysis, Turbine blades.
Identifiers: *Meetings.

For abstract, see STAR 1719

21G. Reciprocating Engines

AD-A070 528/5GA PC **A16**/MF **A01**
Institute for Defense Analyses Arlington VA Science and Technology Div
Technology Assessment of Advanced Propulsion Systems for Some Classes of Combat Vehicles. Volume 2. Appendices A-F.
Final rept.,
Frederick R. Riddell, and Donald M. Dix. Sep 78, 354p IDA-P-1278-Vol-2, IDA/HQ-77-19843, AD-E500 067
Contract DAHC15-73-C-0200
See also Volume 3, AD-A070 529.

Descriptors: *Heat engines, *Gas turbines, *Combat vehicles, Diesel engines, Fuel consumption, Marine engines, Closed cycle systems, Brayton cycle, Internal combustion engines, Propulsion systems, Sizes(Dimensions), parametric analysis, Naval vessels, High velocity, Ground vehicles, Land combat, Tanks(Combat vehicles), Military requirements, Mobility, Marine surface propulsion, Surface propulsion.
Identifiers: Otto cycle engines, Open Brayton cycle engines, *Technology assessment.

Contents: Relationship of Propulsion System Parameters to Land Combat Vehicle Characteristics; Relationship of Propulsion System Parameters to the Characteristics of High-Speed Ships; Size and Specific Fuel Consumption Relationships in Otto-Cycle Engines; Size and Specific Fuel Relationships for Diesel Engines; Size and Fuel Consumption Relationships for Open Brayton-Cycle Engines; and Size and Specific Fuel Consumption Realtionships for Closed Brayton-Cycle Engines.

AD-A070 529/3GA PC **A13**/MF **A01**
Institute for Defense Analyses Arlington VA Science and Technology Div
Technology Assessment of Avanced propulsion Systems for Some Classes of Combat Vehicles. Volume 3. Appendices G-M.
Final rept.,
Frederick R. Riddell, and Donald M. Dix. Sep 78, 284p IDA-P-1278-Vol-3, IDA/HQ-77-19844, AD-E500 068
Contract DAHC15-73-C-0200
See also Volume 1, AD-A070 534.

Descriptors: *Heat engines, *Transmissions(Mechanical), *Combat vehicles, Propulsion systems, Fuel consumption, Marine engines, Stirling cycle, Electromechanical devices, Drives, Fluid mechanics, Waterjet propulsion, Naval vessels, High velocity, Ground vehicles, Land combat, Tracked vehicles, Tanks(Combat vehicles), Vehicle tracks, Wheels, Supercavitating propellers, Military requirements, Mobility, Thrusters, Surface propulsion.
Identifiers: Hydrodynamic transmissions, Electromechanical transmissions, *Technology assessment.

Partial Contents: Size and Specific Fuel Consumption Relationships for Stirling Engines; Mechanical and Fluid Mechanical Transmissions for Propulsion of Land combat Vehicles and High-Speed Ships; Assessment of the Technology of Electric Transmission Subsystems for Surface Vehicles; Thrusters for Ground Combat Vehicles; and Thrusters for High-Speed Oceangoing Ships.

AD-A070 534/3GA PC **A10**/MF **A01**
Institute for Defense Analyses Arlington VA Science and Technology Div
Technology Assessment of Advanced Propulsion Systems for Some Classes of Combat Vehicles. Volume 1. Summary and Main Text.
Final rept.,
Frederick R. Riddell, and Donald M. Dix. Sep 78, 217p IDA-P-1278-VOL-1, IDA/HQ-77-19842, AD-E500 066
Contract DAHC15-73-C-0200
See also Volume 2, AD-A070 528.

Descriptors: *Heat engines, *Gas turbines, *Transmissions(Mechanical), *Combat vehicles, Diesel engines, Spark ignition engines, Marine engines, Closed cycle systems, Brayton cycle, Stirling cycle, Internal combustion engines, Drives, Fluid mechanics, Waterjet propulsion, Naval vessels, High velocity, Ground vehicles, Land combat, Tracked vehicles, Tanks(Combat vehicles), Vehicle tracks, Wheels, Propellers(Marine), Military requirements, Mobility, Thrusters, Propulsion systems.
Identifiers: Otto cycle engines, Hydrodynamic transmissions, Electromechanical transmissions, *Technology assessment.

This paper presents the results of a study of propulsion systems for surface combat vehicles which is intended to provide information useful to the Defense Advanced Research Projects Agency in identifying high-payoff R and D prospects. The primary purposes of the paper are to: (1) quantify the technological advances needed to make major improvements in appropriate military propulsion systems and indicate relative payoffs; and (2) provide criteria for evaluation of new propulsion system or subsystem concepts. The scope of the study is limited to an assessment of propulsion systems for four classes of surface combat vehicles: (1) main battle tanks; (2) light, tracked land combat vehicles; (3) high-mobility land combat vehicles; and (4) high-speed (more than 50 knots) ships. For propulsion subsystems, five engine types of (otto, Diesel, gas turbine, closed Brayton, Stirling), three transmission types (mechanical, hydrodynamic, electrical), and four thruster types (tracks, wheels, propellers, waterjets) are examined in some detail. Results are presented in terms of technology goals which are within the bounds of what is judged to be physically possible and which together in relevant sets would have a major impact on the cost or performance of armored land vehicles or of high-speed ships. Relative payoffs within each set of goals are also estimated.

AD-A070 767/9GA PC **A04**/MF **A01**
FMC Corp San Jose CA Ordnance Engineering Div
A Variable Fill Fluid Coupling Fan Drive with Electronic Speed Control for M113A1E1 Test Rig Vehicle.
Final rept. Sep 77-Mar 79,
Alan M. Loss, and Alan J. Samuel. 1 Mar 79, 62p FMC-TR-3441, TARADCOM-TR-12441
Contract DAAK30-77-C-0067

Descriptors: *Cooling fans, *Speed regulators, *Variable speed drives, Electronic equipment, Internal combustion engines, Temperature control, Armored personnel carriers, Hydraulic couplings, Modulation, Test vehicles.
Identifiers: M-113 vehicles, M-113A1E1 vehicles, Design.

The work completed under this contract included the design, fabrication, and installation of a Variable Fill Fluid Coupling (VFFC) Fan Drive with Electronic Speed Control into the M113A1E1 Test Rig Vehicle, as well as dynamometer hot room testing of the VFFC in the vehicle. Besides providing the control for modulating fan speed according to coolant temperature, the Electronic Controller (EC) limits the fan speed (overspeed control) to a preset maximum value, regardless of engine speed, and reduces control flow to a preset minimum value during low engine speed operation, regardless of coolant temperature. (Author)

AD-A071 002/0GA PC **A08**/MF **A01**
Michigan Univ Ann Arbor Dept of Aerospace Engineering
Critical Assessment of Emissions from Aircraft Piston Engines.
Final rept. Jun 74-May 78,
W. Mirsky, R. Pace, R. Ponsonby, J. A. Nicholls, and D. E. Geister. Jun 79, 158p FAA-RD-78-82, FAA-NA-78-166
Contract DOT-FA74NA-1102

Descriptors: *Aircraft engines, *Piston engines, *Emission, *Air pollution, Mathematical models, Fuel air ratio, Molecular weight, Exhaust gases, Combustion products.
Identifiers: LIO-320 engines.

A comprehensive mathematical analysis for evaluating the measured emissions from piston type general aviation aircraft engines is presented and discussed. The analysis is used to calculate the fuel-air ratio, molecular weight of the exhaust products, and water correction factor. Further. a sensitivity analysis is presented which shows the effects of emission measurement errors on calculated fuel-air ratio. The University's test facility is briefly described and the associated emissions instrumentation is discussed in detail. The experimental results obtained in this facility on the AVCO-Lycoming LIO-320 engine are presented. This includes baseline and lean-out emissions data and the influence of sampling probe location in the exhaust pipe. The influence of leaks in the exhaust system or emissions console are investigated and evaluated in terms of the mathematical model. Experimental data obtained from various facilities are compared and evaluated. (Author)

DOE/NASA/1040-78/30 PC **A03**/MF **A01**
National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center.
Initial Comparison of Single Cylinder Stirling Engine Computer Model Predictions with Test Results.
R. C. Tew, Jr., L. G. Thieme, and D. Miao. 1979, 38p NASA-TM-79044, CONF-790216-4
Contract EC-77-A-31-1040
1979 SAE Congress and Exposition Engine Modeling Session, Detroit, MI, USA, 26 Feb 1979.

Descriptors: *Stirling engines, Computer calculations, Computer codes, Experimental data, Graphs, Helium, Hydrogen, Mathematical models, Performance, Performance testing, Tables, Theoretical data.
Identifiers: ERDA/425003.

For abstract, see ERA citation 04:043643.

21H. Rocket Motors and Engines

N79-28225/7GA PC **A12**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Handbook of Recommended Practices for the Determination of Liquid Monopropellant Rocket Engine Performance.
R. A. Bjorklund, R. S. Rogero, and R. K. Raerwald. Jun 79, 265p NASA-CR-158793, JPL-79-32
Contract NAS7-100
Subm-Sponsored in Part by AFRPL.

Descriptors: *Engine tests, *Liquid propellant rocket engines, *Monopropellants, Performance tests, Exhaust gases, Flow measurement, Handbooks, Pressure measurements, Propellant mass ratio, Temperature measurement.

For abstract, see STAR 1719

N79-28226/5GA PC **A04**/MF **A01**
Colorado State Univ., Fort Collins.
A Simplified Computer Program for the Prediction of the Linear Stability Behavior of Liquid Propellant Combustors.
C. E. Mitchell, and K. Eckert. Aug 79, 59p NASA-CR-3169
Contract NGR-06-002-095

Descriptors: *Combustion stability, Computer programs, *Liquid propellant rocket engines, Prediction analysis techniques, Acoustic attenuation, Approximation, Baffles, Green function, Partial differential equations, Slots.

For abstract, see STAR 1719

21I. Rocket Propellants

N79-28345/3GA PC **A08**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Alternate Propellant Program, Phase 1.
Final Report.
F. A. Anderson, and W. R. West. 1 Jul 79, 161p NASA-CR-158815, JPL-PUB-79-29
Contract NAS7-100

Descriptors: *Solid rocket propellants, *Space shuttle boosters, *Spacecraft propulsion, Ammonium perchlorates, Exhaust gases, Hydrochloric acid.

For abstract, see STAR 1719

N79-28350/3GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
Axial Jet Mixing of Ethanol in Cylindrical Containers During Weightlessness.
J. C. Aydelott. Jul 79, 43p NASA-TP-1487, E-9937

Descriptors: *Cylindrical tanks, *Ethyl alcohol, *Liquid rocket propellants, *Mixing, *Weightlessness, Flow distribution, Fluid dynamics, Geometry, Graphs (Charts), Jet mixing flow, Tables (Data).

For abstract, see STAR 1719

22. SPACE TECHNOLOGY

22A. Astronautics

AD-A070 634/1GA PC **A04**/MF **A01**
IBM Federal Systems Div Houston TX
Department of Defense Space Transportation System Orbiter Avionics Software Integration Study. Analysis of Orbiter Systems to Meet MASE Requirements.
Special study rept. Feb-Apr 79,
L. S. Diamant, E. W. Smythe, and R. H. Wolfe, Jr. 17 Apr 79, 61p RES-78-11-1, SAMSO-TR-79-37
Contract F04701-76-C-0271

Descriptors: *Space shuttles, *Data processing, Digital computers, Microprocessors, Display systems, Avionics, Integrated systems.

This study analyzes the use of the Space Shuttle Orbiter data processing subsystems in satisfying requirements for the integral astronaut participation in selected DoD space shuttle experiments. Key aspect of the study was the analysis, based on system implementation, to determine degrees of data protection from unauthorized use. Typical image processing and enhancing techniques versus display response time for astronaut interactions were assessed. The study concluded that a degree of data protection is achieved with the present orbiter avionics system by isolating one of the five general purpose computers with an out-of-sync procedure. Additional levels of data protection could be achieved only with additional hardware. (Author)

N79-28192/9GA PC **A14**/MF **A01**
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
Early Space Experiments in Materials Processing.
R. J. Naumann. Jul 79, 323p NASA-TM-78234

Descriptors: Aerospace environments, Experimentation, Materials science, Processing, *Production engineering, Reduced gravity, Space programs, Bioengineering, Crystal growth, Experimental design, Fluid mechanics, Gravitational effects, Metallurgy, Onboard equipment, Project planning, Skylab program, Spacecraft environments, Utilization, Weightlessness.
Identifiers: *Space processing.

For abstract, see STAR 1719

N79-28201/8GA PC **A03**/MF **A01**
Jet Propulsion Lab., Pasadena, CA.
Autonomous Mechanical Assembly on the Space Shuttle: An Overview.
M. H. Raibert. 15 Jul 79, 34p NASA-CR-158818, JPL-PUB-79-62
Contract NAS7-100

Descriptors: Airborne/spaceborne computers, Automata theory, Cybernetics, *Manipulators, *Orbital assembly, *Space shuttles, Algorithms, Control, Robots, Sensors, Servomechanisms, Technology assessment, Teleoperators.

For abstract, see STAR 1719

N79-28202/6GA PC **A02**/MF **A01**
Committee on Space Research, Paris (France).
Space Research Activities in the German Democratic Republic.
W. Boehme, and R. Knuth. 1979, 15p
Conf-Presented at 22d Meeting of Cospar, Bangalore, India, 1979.

Descriptors: *East Germany, Environmental monitoring, *Space programs, Atmospheric physics, Geodetic surveys, Geophysics, Research and development, Space flight.

For abstract, see STAR 1719

N79-28204/2GA PC **A03**/MF **A01**
Varian Associates, Inc., Palo Alto, CA.
Development Program for a 200 kW, Technological Processes in Space.
H. Jory. 1978, 30p ORNL/SUB-01617/10, QR-10
Contract W-7405-ENG-26
Tran-Transl. into English of "Teoreticheskiye Osnovy Provedeniya Nekotorykh Tekhnologicheskikh Protsessov V Kosmose", Rept. Pr.-435 Acad. Of Sci. USSR, Inst. Of Space Res., Moscow, 1978 p 1-29. Subm-Transl. By Kanner (Leo) Associates, Redwood City, Calif.

Descriptors: Aerospace environments, *Crystal growth, Melts (Crystal growth), *Space processing, Weightlessness, Acceleration (Physics), Conservation equations, Fluid dynamics, Gravitational effects, Interfacial tension.
Identifiers: Translations.

For abstract, see STAR 1719

N79-28205/9GA PC **A03**/MF **A01**
National Aeronautics and Space Administration, Washington, DC.
Theoretical Bases for Conducting Certain Technological Processes in Space.
A. S. Okhotin. Jun 79, 30p NASA-TM-75637, PR-435
Contract NASW-3199
Tran-Transl. into English of "Teoreticheskiye Osnovy Provedeniya Nekotorykh Tekhnologicheskikh Protsessov V Kosmose", Rept. Pr-435 Acad. Of Sci. USSR, Inst. Of Space Res., Moscow, 1978 p 1-29. Subm-Transl. By Kanner (Leo) Associates, Redwood City, Calif.

Descriptors: Aerospace environments, *Crystal growth, Melts (Crystal growth), *Space processing, Weightlessness, Acceleration (Physics), Conservation equations, Fluid dynamics, Gravitational effects, Interfacial tension.
Identifiers: Translations.

For abstract, see STAR 1719

N79-28223/2GA PC **A02**/MF **A01**
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
Application of the Minimum Correlation Technique to the Correction of the Magnetic Field Measured by Magnetometers on Spacecraft.
F. Mariani. Apr 79, 22p NASA-TM-80289
Subm-Submitted for Publication.

Descriptors: Covariance, *Interplanetary magnetic fields, *Magnetic measurement, Magnetometers, Spacecraft instruments, Drift(Instrumentation), Helios 1, IMP, Spacecraft charging, Tables (Data).
Identifiers: IMP-8 satellite, Helios 2.

For abstract, see STAR 1719

N79-28471/7GA PC **A03**/MF **A01**
Colorado State Univ., Fort Collins. Coll. of Engineering.
Particle Dynamics Associated with the Space Environment.
V. A. Sandborn. Jul 79, 30p NASA-CR-3156, M-285
Contract NAS8-31688

Descriptors: *Dust, *Spacecraft environments, Spacelab, Aerosols, Knudsen flow, Reynolds number, Weightlessness.

For abstract, see STAR 1719

N79-28645/6GA PC **A07**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
SEASAT-A Satellite Scatterometer Mission Summary and Engineering Assessment Report.
J. W. Johnson, W. H. Lee, and L. A. Williams. May 79, 146p NASA-TM-80122

Descriptors: Oceanography, Remote sensors, *Scatterometers, *SEASAT-A satellite, Data processing, Graphs (Charts), Mission planning, Tables (Data).
Identifiers: Ocean surface, Wind(Meteorology), Air water interactions, Performance evaluation.

For abstract, see STAR 1719

PATENT-4 158 742 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
General Purpose Rocket Furnace.
Patent,
B. R. Aldrich, and W. D. Whitt. Filed 30 Nov 76, patented 19 Jun 79, 17p N79-26075/8, PAT-APPL-746 578
Supersedes PAT-APPL-746 578-76, N77-12070 (15 - 03, p 0292).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: *Aerospace environments, *Combustion chambers, Equipment specifications, *Patents.
Identifiers: PAT-CL-13-20, *Metallurgical furnaces, Isothermal processes.

A multipurpose furnace for space vehicles used for material processing experiments in an outer space environment is described. The furnace contains three separate cavities designed to process samples of the widest possible range of materials and thermal requirements. Each cavity contains three heating elements capable of independent function under the direction of an automatic and programmable control system. A heat removable mechanism is also provided for each cavity which operates in conjunction with the control system for establishing an isothermally heated cavity or a wide range of thermal gradients and cool down rates. A monitoring system compatible with the rocket telemetry provides furnace performance and sample growth rate data throughout the processing cycle.

22B. Spacecraft

N79-28137/4GA PC **A04**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Space Shuttle Orbiter Trimmed Center-of-Gravity Extension Study. Volume 5: Effects of Configuration Modifications on the Aerodynamic Characteristics of the 140A/B Orbiter at Mach Numbers of 2.5, 3.95 and 4.6.
W. P. Phillips, and R. H. Fournier. Jun 79, 54p NASA-TM-72661

Descriptors: *Aerodynamic characteristics, *Canard configurations, Center of gravity, *Space shuttle orbiters, *Supersonic flight, Wind tunnel stability tests, Graphs (Charts), Lift drag ratio, Scale models, Tables (Data), Wing planforms.

For abstract, see STAR 1719

N79-28219/0GA PC **A08**/MF **A01**
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX
Space Transportation System Payload Safety Guidelines Handbook.
Jul 78, 159p NASA-TM-80421, JSC-11123

Descriptors: *Payload delivery (Sts), *Safety factors, *Space transportation system, Flight safety, Handbooks, Hazards, Space shuttles.

For abstract, see STAR 1719

N79-28221/6GA PC **A03**/MF **A01**
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Cyclic Tests of P-Bulb End-Seal Designs for a Shuttle-Type Wing-Elevon Cove Membrane Seal.
L. R. Hunt. Jul 79, 30p NASA-TM-80093, L-12958

Descriptors: *Aerothermodynamics, *Reentry vehicles, *Seals (Stoppers), Cyclic loads, Friction, Life (Durability).

For abstract, see STAR 1719

N79-28222/4GA PC **A13**/MF **A01**
Martin Marietta Aerospace, Denver, CO.

On-Board Attitude Determination System (OADS).
Final Study Report.
P. Carney, M. Milillo, V. Tate, J. Wilson, and K. Yong. Apr 78, 277p NASA-CR-158842, MCR-78-514
Contract NAS5-23428

Descriptors: Airborne/spaceborne computers, *Attitude (Inclination), *Space missions, *Spacecraft instruments, Systems engineering, Microprocessors, Mission planning, Multimission modular spacecraft, Space transportation system, Star trackers.

For abstract, see STAR 1719

PATENT-4 156 548 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
Magnetic Suspension and Pointing System.
Patent,
W. W. Anderson, and N. J. Groom. Filed 27 Feb 76, patented 29 May 79, 4p N79-26372/9, PAT-APPL-662 182
Supersedes PAT-APPL-662 182-76, N76-18227 (14 - 09, p 1095).
This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, DC. 20231 $0.50.

Descriptors: *Magnetic suspension, *Pointing control systems, *Spacecraft motion, Attitude control, Gimbals, *Patents, Spacecraft instruments.
Identifiers: PAT-CL-308-10, *Stabilized platforms.

Apparatus for providing accurate pointing of instruments on a carrier vehicle and for providing isolation of the instruments from the vehicle's motion disturbances is presented. The apparatus includes two assemblies, with connecting interfaces, each assembly having a separate function. The first assembly is attached to the carrier vehicle and consists of an azimuth gimbal and an elevation gimbal which provide coarse pointing of the instruments by allowing two rotations of the instruments relative to the carrier vehicle. The second or vernier pointing assembly is made up of magnetic suspension and fine pointing actuators, roll motor segments, and an instrument mounting plate around which a continuous annular rim is attached which provides appropriate magnetic circuits for the actuators and the roll motor segments. The vernier pointing assembly provides six degree-of-freedom isolation from carrier motion disturbances.

22C. Spacecraft Trajectories and Reentry

AD-A071 092/1GA PC **A05**/MF **A01**
Naval Surface Weapons Center Dahlgren Lab VA
Five Algorithms for the Earth Tide Terms in the Force Model of NSWC Computer Programs for Satellite Geodesy.
Final rept.,
Walter Groeger. Feb 79, 78p Rept no. NSWC/DL-TR-3912

Descriptors: Gravity, Tides, Earth(Planet), Delay, Computer programs, Artificial satellites, Orbits, Perturbations, Algorithms, Subroutines, Diurnal variations, Ocean tides, Atmospheric tides, Moon, Sun, Mass, Geopotential, Inertia.
Identifiers: *Earth tides, *Orbit perturbation, Satellite perturbation.

The most recent versions of five computer algorithms which jointly specify the gravitational action by which the tidal dislocation of the earth's masses perturbs satellite motion are presented. The first computer routine formulates the perturbing acceleration which the semidiurnal lunar component of the atmospheric tide bulge exerts on the orbit of an aritificial earth satellite. The second routine augments the first by spelling out the combined effect of solar heating and solar mass attraction. The third algorithm accounts for the ocean tide. Only the semidiurnal lunar tide is presently considered, but the algorithm sets the pattern for introducing various other spectral components of the fluid tide, if desired. The algorithm starts from a table for the global tide amplitudes and phase angles. It subsequently approximates the gravitational potential exterior to the earth caused by the tidal bulge by that of a system of point masses located on the ocean surface. The fourth tide routine is optional: it may be used in place of the third algorithm if one wishes to base the tide potential on a functionalization of the tidal sea surface. Finally, there is a computer routine for the Newtonian attraction caused by the tide bulge of the solid earth. Both the lunar and solar tide components are included. The tidal properties are assumed to be functions of latitude. Accordingly, Love coefficients are featured that are zonal harmonic expansions of latitude.

N79-28206/7GA PC **A07**/MF **A01**
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
OPS MCC Level B/C Formulation Requirements: Area Targets and Space Volumes Processor.
M. J. Bishop, Jr. Jul 79, 139p NASA-TM-80485, REPT-79-FM-26

Descriptors: *Orbital position estimation, *Spacecraft tracking, Vector analysis, Algorithms, Central processing units, Polyhedrons.

For abstract, see STAR 1719

N79-28208/3GA PC **A05**/MF **A01**
Analytical and Computational Mathematics, Inc., Houston, TX.
Application and Analysis of Satellite Orbit Prediction Techniques.
12 Apr 77, 80p NASA-CR-157219, JSC-12571
Subm-Sponsored by NASA.

Descriptors: Artificial satellites, Differential equations, Orbits, Truncation errors, Algorithms, Computer programs, Equations of motion, Mathematical models, Numerical integration.
Identifiers: *Orbit calculation, Orbital positon estimation.

For abstract, see STAR 1719

N79-28211/7GA PC **A13**/MF **A01**
Ohio State Univ. Research Foundation, Columbus.
Estimability and Simple Dynamical Analyses of Range (Range-Rate Range-Difference) Observations to Artificial Satellites.
B. H. W. Vangelder. Dec 78, 286p NASA-CR-158843, REPT-284
Grant NSG-5265

Descriptors: *Artificial satellites, *Laser range finders, *Orbital position estimation, *Range and range rate tracking, Statistical analysis, Circular orbits, Elliptical orbits, Lageos (Satellite), Orbital elements, Satellite orbits.

For abstract, see STAR 1719

N79-28212/5GA PC **A02**/MF **A01**
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
Nota Technia APT 78-4 (Technical Notes APT 78-4).
M. Elias. Feb 79, 14p INPE-1419-NTE/144
Language in Portugese.

Descriptors: NOAA 4 satellite, NOAA 5 satellite, Periodicals, Satellite tracking, Satellite transmission, Tiros N satellite, Data acquisition, Imaging techniques, Microwaves, *Polar orbits, Stratosphere, Telemetry.
Identifiers: *Meteorological satellites.

For abstract, see STAR 1719

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AD-A070 997/2GA 7D

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AD-A071 044/2GA 7D

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ED-163 901 5B

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Some Potential Effects of Acid Rain on Forest Ecosystems: Implications of a Computer Simulation.
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Physical and Chemical Behavior of Liquefied Coal in Solids Separation. Quarterly Report, January--March 1978.
FE-2550-6 21D

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Experimental Superposition of Acoustic Fields for Detection Performance Studies.
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AD-A070 681/2GA 8J

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Nitrogen Oxide Interferences in the Measurement of Atmospheric Particulate Nitrates.
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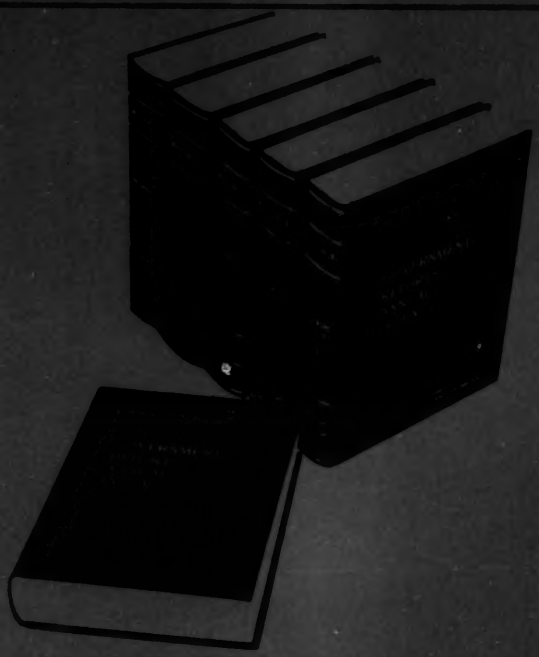

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PB-298 744/4GA 13M

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West Virginia Univ., Morgantown. Dept. of Geology and Geography.
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National Measurement Lab Washington DC Polymer Science and Standards Div
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Scripps Institution of Oceanography San Diego CA Marine Physical Lab
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Case Western Reserve Univ Cleveland OH Dept of Macromolecular Science
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Stanford Univ CA Inst for Plasma Research.
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Rensselaer Polytechnic Inst Troy NY Dept of Mechanical Engineering Aeronautical Engineering and Mechanics
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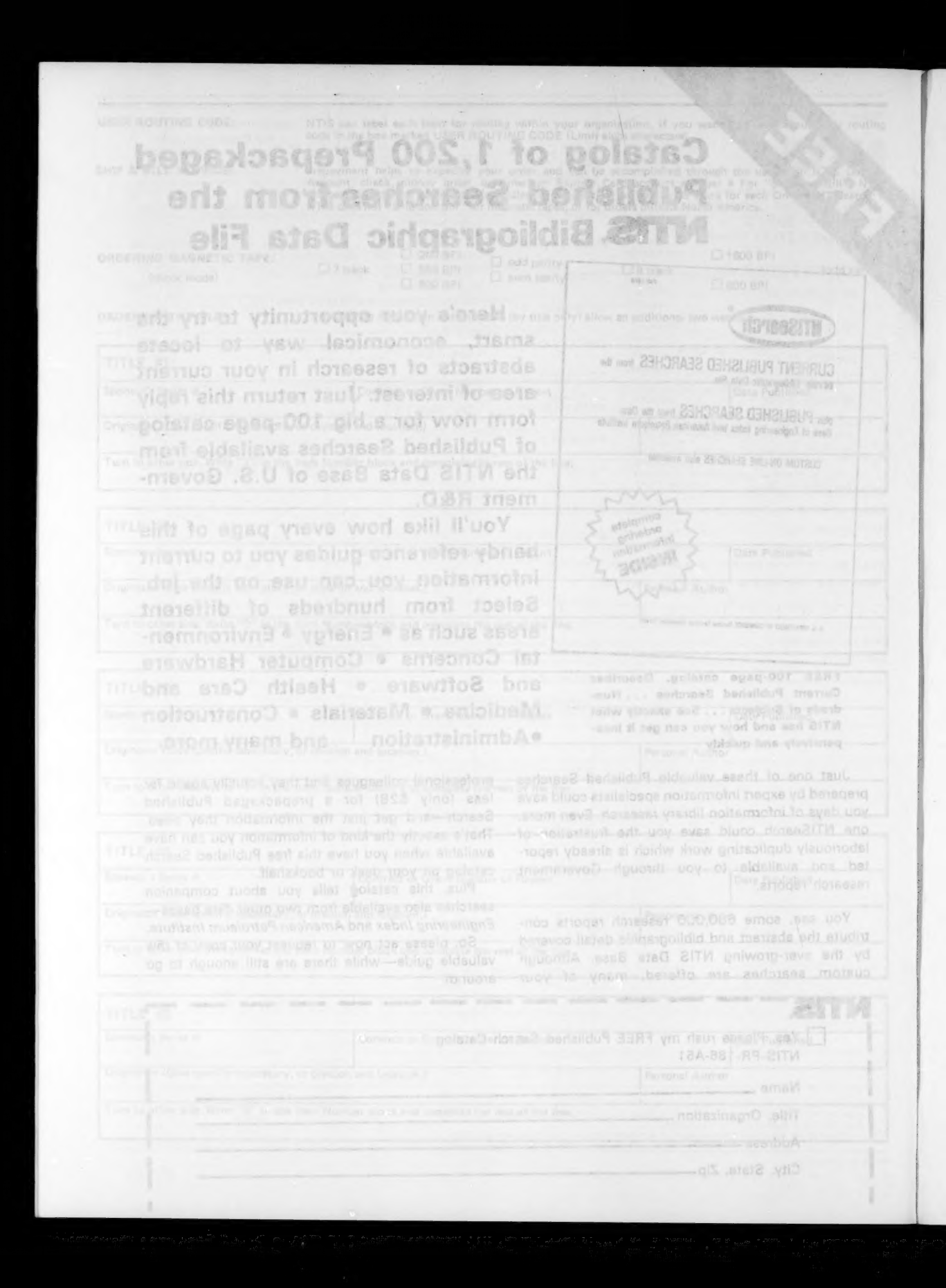

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